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Stream Pollution by Paper Mills Abating

State Bureau Reports A Decrease of 4 Per Cent In Paper Fiber Discharged In Wisconsin Paper Mills Areas In 1940—Paper Mill Employment Continues At High Level — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 3, 1941—Paper fiber discharged into rivers in the Wisconsin paper mills areas decreased a net of four per cent in 1940, the state bureau of sanitary engineering reported last week at a meeting at Madison, Wis. of the state advisory committee on pulp and paper waste disposal.

This committee, organized in 1926, cooperates with the Wisconsin State Board of Health in minimizing pollution. Wisconsin is the only state with a continuous program for control of paper and pulp wastes, the bureau reported.

H. A. Rothschild of Kimberly-Clark Corporation, Neenah, Wis., heads the committee. Others attending the meeting were: E. P. Gleason, Nekoosa-Edwards Paper Company, Port Edwards, Wis.; W. F. Thiele, Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis.; A. G. Wakeman, Fox River Paper Corporation, Appleton, Wis.; M. L. Downs, Thilmany Pulp and Paper Company, Kaukauna, Wis., and J. A. Extrom, Tomahawk Kraft Paper Company, Tomahawk, Wis.

Another step in the elimination of pollution was announced last week by J. M. Conway, president and general manager of the Hoberg Paper Mills, Inc., Green Bay, Wis., who is chairman of the Sulphite Pulp Manufacturers' Committee on Waste Disposal. A pilot plant is to be constructed to study the large scale use of trickling filters for the disposal of sulphite liquor. This method, tried on a small scale in a year's experiments at the Institute of Paper Chemistry, Appleton, Wis., sprays the sulphite liquor into the air and permits it to trickle through a bed of coarse gravel. In this process it picks up sufficient oxygen to oxidize the constituents and, consequently, the oxygen supply of the streams into which it flows is not depleted to jeopardize fish life.

Another method known as methane fermentation will be tried next by the committee through the research laboratories of the Institute.

Paper Mill Employment High

January employment in Wisconsin mills and allied industries showed a slight tapering off from the December record, but is still ahead of the same month a year ago, according to reports of the Wisconsin Industrial Commission. The estimated number of wage earners dropped from 21,900 to 21,700, a decrease of 0.9 per cent. In January a year ago the number was 21,000, and now stands 3.4 per cent above that figure.

Weekly payrolls in January totalled $590,000, as compared with $607,000 in December, and $530,000 in January of last year. This is a decrease of 2.9 per cent for the month, and a gain of 11.3 per cent over January, 1940. The average number of hours worked in January was 41.4 per week, average earnings were $27.22 per week, and the average hourly wage rate was 65.7 cents.

Printing, publishing and allied industries showed a decrease of 0.7 per cent, in the number of employees but stood 3.4 per cent ahead of January, 1940. Total payrolls were down 3.7 per cent, but are 6.7 per cent ahead of a year ago. Plants are working an average of 39 hours at average weekly wages of $33.87, and an average hourly rate of 86.9 cents.

In the Milwaukee metropolitan area, largely in the carton and converting field, nineteen industries reported a total of 1,877 workers, a decline of 1.3 per cent from December, and $47,700 in total payrolls for January, a decline of 3.3 per cent from December. The average work week in January was 39.9 hours, with $25.41 average earnings and an average hourly rate of 63.6 cents.

Mills Assessed Water Tolls

Water power tolls amounting to $115,000 will be collected for the last six months of 1940 by the Chippewa and Flambeau Improvement Company, according to authorization by the Wisconsin Public Service Commission. These apply to mills and power plants utilizing flowage benefits on the Chippewa and Flambeau Rivers.

Tolls are divided as follows: Flambeau Paper

(Continued on page 19)

Demand Improves for Many Lines of Paper

Stronger Paper Market and Broader Demand Reported From Chicago, With Kraft Market In Good Position—Chicago Concerns Contract For Water Shipments From Texas — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 3, 1941—There is plenty of business in the Chicago paper market with a definite strengthening of all lines in daily evidence. Thus far, according to local reports, most of the upward swing has been in the nature of consolidating gains. However, demand is sufficiently broadening out and mills are reported so busy as to indicate that the present stiffening up may break through the present list at any time.

Specifically, krafts seem to have done the most in the line of consolidating gains. The market is strong and has plenty of continued power behind it. Sulphites are likewise very steady with mills running behind schedule and a firming up indicated all along the line. Books and covers have also responded to improvement and selling at list prices is now reported as the characteristic rather than the exception locally. Newsprints and groundwoods reported February as "excellent" with demand broadening out on all sides. Waste paper remained firm, with the higher grades showing the most strength according to local reports. Quotations for waste paper will remain unchanged for March according to paper mill representatives here. Roofing rags were increased $2 a ton for the current month, say official sources.

Plan Waterway Shipments

According to local reports, it seems obvious that Chicago firms securing paper from new mills at Houston, Texas, have entered into a contract for barge line transportation from the gulf to Chicago. A member line has submitted a proposal for a rate of 34 cents a 100 pounds on printing paper, other than newsprint. The 34 cent rate would apply on 70,000 pound minimum carloads in cars 41 feet and less and 80,000 pounds minimums in longer cars. The present applicable rate is 56 cents a hundred pounds, minimum car load 40,000 pounds. In support of the suggested 34 cent all-rail rate, it is indicated that the Chicago consignee is now paying a contract barge line 27½ cents a 100 pounds from Houston to Chicago plus one cent a hundred pounds insurance, 3½ cents unloading at Chicago and two cents trucking from Chicago back to the consignee's plant, making a total of 34 cents. The rate, if approved, would necessitate obtaining of fourth section relief. The proposal has been submitted to the Southwestern Freight Bureau.

Starch Company Reports Progress

The Stein-Hall Company, manufacturer of starch, is reported to have recently perfected several new processes of interest to the paper industry. The result of many years of experience, according to D. E. Hawley, research director of Stein-Hall, the new method covers converting of the dextrine of starch into industrial products. The process, closely guarded by the Chicago concern, is said to have many potential outlets for starch products. Mr. Hawley pointed out, for example, that the heavy paper tape used to seal packages has always been made with glue of animal origin. The same glue was used where a flexible, warpless product was needed. Starch glue now is said to fill these requirements and to lack the odor and taste of animal glue. Wallpaper manufacturers will shortly bring out a new series of papers based on successful experiments conducted by the starch industry. All that will be necessary is to wet the back of the paper and stick it on the wall—no paste, no trimming. The back of these papers will be coated with the new starch glue and the paperhangers task made much easier. Mr. Hawley, in a locally published article, also pointed out the long effort of his industry to develop a paste suitable for every use in the corrugated board industry and indicated that the new and improved paste has proved more efficient in some respects than the sodium silicate products in tests made by the paper makers themselves. This year 25,000 tons of starch, using 1,500,000 bushels of corn, is expected to go into this field alone.

The western division of the Salesmen's Association of the Paper Industry held its first meeting with newly elected officers on last Monday. C. H. Reeves, western vice-president and Burt Fisher, assistant western vice-president, were "in the saddle." Outstanding service award winner Ben Babbitt had a new traveling bag to show for his trip East while past presidents from the western division including George K. Gibson, James H. Coy, Harold R. Knott, Creighton Whiting and John T. Burruss were also recipients of special honors.

Executive Returns to Local Duties

Albert J. Browning, who has been serving as deputy director of the division of purchases in the office of production management at Washington, has returned to his position as president of the United Wall Paper Factories in Chicago and Joliet. Mr. Browning will be succeeded in Washington by D. C. MacKeachie, former purchasing executive of a chain store organization.

Buys Paper Under Walsh-Healey Act

WASHINGTON, D. C., March 5, 1941—During the week ended February 15, the Government purchased $121,982.15 worth of paper and allied products under the Walsh-Healey Act as follows: $57,480.00 worth of mimeograph paper for Navy, S & A, from R. P. Andrews Paper Company, Washington, D. C.; $15,554.50 worth of paper cups for War, Med. Boston, from Boston Drinking Cup Company, Div. Boston Envelope Company, Dedham, Mass.; $30,641.74 worth of bond paper for Navy, S&A, from The Old Dominion Paper Company, Norfolk, Va.; and $18,305.91 worth of paper cups for War, Med. Brooklyn, from Burnitol Manufacturing Company, Boston, Mass.

Charge Monopolistic Buying of Pulpwood

WASHINGTON, D. C., March 5, 1941—The House Committee on Agriculture has favorably reported with some amendments the Fulmer resolution (H. J. Res. 15) "to investigate the apparent monopolistic purchasing of pulpwood by pulp and paper mills."

Purpose of the Legislation

The committee in making its favorable report says in part:

The facts are fully set forth in the hearings of the committee held on February 11, 12 and 13, 1941. The purpose of the legislation, as set forth in the resolution and as shown from the hearings, is as follows, to investigate—

(1) the apparent monopolistic purchase procedure of pulpwood through contractors and prices being paid to these contractors and the price paid to subcontractors and buyers of pulpwood and the price paid to farmers, and owners of pulpwood, including standard of wages paid in pulp and paper mills to wage earners, including wages paid for cutting and hauling pulpwood;

(2) the current cost of producing and distributing wood pulp and paper;

(3) any related factors required in determining whether wage earners, farmers, and other forest owners or operators are receiving for their wages, stumpage, and pulpwood a fair and equitable share of the sale price of pulp and paper during the past year and a fair and equitable share of the 30 per cent recent increase in the price of paper;

(4) the relationship of pulp and paper mill associations of which the manufacturers of pulp and paper are members;

(5) the ownership and control of domestic pulp and paper mills;

(6) the influence and control that these associations have over the operations of their members as to controlled production, distribution, and the actual fixing of prices under trade practice rules and regulations formulated and agreed to by members of said associations; and

(7) the effect of prices of imports on domestic prices.

What the Testimony Showed

The testimony submitted to the committee definitely indicates that the pulp and paper mills of the United States buy pulpwood through regional agents called contractors who enter into a signed contract with the pulp and paper mills. These regional contractors then make contracts with one or more subcontractors who proceed to employ wage earners for the purpose of cutting, hauling, and lading pulpwood on cars, and according to the testimony submitted to the committee, out of the amount paid to these subcontractors by the regional agents, wage earners are receiving barely enough to buy the real necessities of life. These subcontractors then proceed to purchase from farmers or other private landowners the timber on their wood lots of private lands, paying so much for the whole area, round lots.

According to the testimony and various letters received from farmers and others, farmers are receiving anywhere from 50 cents to $1 per unit containing 160 cubic feet, which amounts to from 35 cents to 80 cents per standard cord of 128 cubic feet. The hearings contained definite information that these regional agents are allotted special areas and that farmers have to sell through these agents in that they are not able to sell direct to the mills, and in that other contracting agents are not permitted to purchase pulpwood except in their own special allotted area.

Our Forest Resources are Adequate

In favorably presenting the resolution the following report from the Forest-Service of the United States Department of Agriculture in part was presented:

In 1938, the most recent year for which complete statistics are available, the United States consumed 13,388,000 tons of paper, an average of 206 pounds per person. The larger part of this paper, with the exception of newsprint, was manufactured in the United States. Our pulp and paper industry drew heavily, however, upon Canadian and Scandinavian sources for wood pulp, from which paper is made, and upon Canada for pulpwood from which wood pulp is made.

It can be said, then, that normally about 50 per cent of the wood used to meet our paper requirements is imported, 10 per cent of it in the form of pulpwood, 20 per cent in the form of wood pulp, and 20 per cent in the form of paper.

On the basis of the 1937 Census of Manufactures, the labor of approximately 72,000 people (to whom about $72,000,000 would be paid annually in wages and salaries) would be required to produce the pulp and paper products normally imported. Some 10,000,000 acres of forest land would need to be scientifically managed to produce an annual crop of about 7,000,000 cords of pulpwood permanently. This is on the basis that the management would be limited to the production of pulpwood. If—as would be the much more desirable and probable form of forest management—only one-half of the yield was cut for pulpwood, the remainder being held for saw logs and other higher value products, then perhaps 20,000,000 acres would be required. As has often been stated, our forest resources are adequate to take care of these —or even greater requirements—provided that our forest land is managed according to sound forest practices.

New Ball and Roller Bearing Grease

Gulf Oil Corporation—Gulf Refining Company, Gulf Building, Pittsburgh, Pa., has developed two new lines of lubricating greases for ball and roller bearings, which are backed by a number of years of concentrated research by Gulf's technologists.

One, designated Gulf Anti-Friction Grease, is recommended for heavy duty service. The other, Gulf Precision Grease, is recommended for lighter duty and higher speeds. Both have a high melting point and are specially prepared for greatest resistance to oxidation and separation.

Both of these new lubricants are available in a wide range of consistencies for any method of application or operation condition—consistencies recently recommended by the National Lubricating Grease Institute which went into effect March 1, 1941.

R. H. M. Robinson Heads the Reorganized Minnesota & Ontario Paper Co.

MINNEAPOLIS, Minn., March 3, 1941—R. H. M. Robinson, of Minneapolis, was elected president of the Minnesota and Ontario Paper Company March 1 at the initial meeting of the board of directors of the reorganized company appointed on January 10 by Judge Gunnar H. Nordbye, U. S. District Court of the District of Minnesota, Fourth Division.

Named To Key Positions

Mr. Robinson announced that there would be no change in policy in the operation of the new company, and that the following employees of the old company had been named to key positions in the new firm:

R. W. Andrews, senior vice-president; C. T. McMurray, vice-president in charge of sales; R. J. Henderson, vice-president in charge of traffic; R. D. Main, secretary-treasurer; Frank J. Hickling, comptroller; J. H. Davidson, chief engineer and manager of mill operations; J. B. Norman, purchasing agent; L. A. Furlong, director of publishers' sales; E. W. Morrill, sales manager, insulite division; Curtis H. Nance, manager foreign sales and operations, insulite division; G. F. McDonald, sales manager, international lumber division; R. O. Warner, manager of merchant sales, paper division; D. McLeod, vice-president, Kenora; Clarence Larson, resident manager, International Falls, Fort Frances Division; R. Bateman, resident manager, Kenora Division.

The election of officers and subsequent announcement of the appointment of men to key positions in the new company followed consummation on February 28 of the trustees' amended plan of reorganization confirmed by Judge Nordbye on January 10 last. The court on January 10 also appointed a board of nine directors. The members of this board, in accordance with the amended plan of reorganization just consummated, will remain in office for two years. The final order of the court vested the properties of the old company in the new company, and terminated a receivership which began ten years before to the day.

1,500,000 Authorized Shares

Since the old company was found to be insolvent, no provision was made by the court for the issuance of any securities of the old company, or the payment of any cash, to the preferred and common stockholders of the old company.

Of the 1,500,000 authorized shares of new stock, 976,000 shares will be distributable to the bondholders, 348,393 shares will be distributable to the unsecured creditors, 20,151 shares will be reserved for issuance in acquiring claims of certain general creditors of wholly owned Canadian subsidiaries of the old company, and 155,456 shares will be reserved for other appropriate corporate purposes.

The new company is organized under the laws of the state of Minnesota, and has its principal office in Minneapolis, as before.

President Robinson, a National Figure

R. H. M. Robinson, president of the new Minnesota and Ontario Paper Company, is known nationally in the field of business, engineering and naval architecture. His first connection with the company came in December, 1931, when he was appointed receiver, with C. T. Jaffray of Minneapolis, and at the same time was designated as managing receiver. Mr. Robinson, born in Ravenna, Ohio, was graduated with first honors from the U. S. Naval Academy in 1896. He later graduated in naval architecture and engineering from the University of Glasgow, Scotland, in 1898.

In December, 1931, he became managing receiver of the M. & O., and president of its subsidiary companies. In 1934, when the receivership was converted into a trusteeship, he became managing trustee of the M. & O., and continued as such until this year. Mr. Robinson is a director of the American-Hawaiian Steamship Company, Merchant-Sterling Corporation, and Russian Finance and Construction Corporation. He is honorary vice-president of the Society of Naval Architect and Marine Engineers; a past commander of the Connecticut Commandery, military order of Foreign Wars, member of the U. S. Naval Institute, and a member of the Loyal Legion. He was decorated by the president of the Republic of Finland as Commander of the White Rose of Finland in 1938.

R. H. M. ROBINSON
President

R. W. ANDREWS
Senior Vice President

C. T. MCMURRAY
Vice President

R. D. MAIN
Secretary-Treasurer

Key Men Long Connected With Company

The men whose appointments to key positions in the newly organized Minnesota and Ontario Paper Company, as announced by President R. H. M. Robinson, have been associated with the company for many years and are familiar with every phase of its business.

These men have spent all or most of their lives in the paper products, lumber or insulation board business and know their work from the ground up. Some have been associated with the M. & O. for more than a quarter of a century, and are well equipped to handle the world-wide business of the big concern of which they are a part.

Biographical Sketches

Brief summaries of the lives of these men follow:

R. W. ANDREWS, senior vice-president, is a graduate of the University of Maine. As a student at the university, he worked in the woods during his vacations, at timber cruising and land surveying for the Great Northern Paper Company. Following graduation in 1914, he worked in the construction division of the St. Croix Paper Company. In 1917, he went with Hardy S. Ferguson, paper mill engineers, on construction work for the Great Northern Paper Company, and in 1919 helped to design the new mills of the International Paper Company. In 1920, he joined the Minnesota and Ontario Paper Company, as assistant chief engineer. He later played a big role in the construction of the Kenora mills, the mills of the Great Lakes Paper Co., and the new Insulite mill, as well as in the building of additions to the Fort Frances mill and on work in the Seine River Power Plant in Canada. In 1931, when trustees took over management of the M. & O., he was made director of engineering and production, and later was made director of operations. His appointment as senior vice-president of the new Minnesota and Ontario Paper Company is a fitting climax to his long and highly successful association with the organization.

C. T. MCMURRAY, vice-president in charge of sales, Minnesota and Ontario Paper Company, was born in Belfast, Ireland. He came to Minneapolis as a boy in 1900 and received his education here. His first job was with the Soo Line Railroad, for which he worked in various capacities until 1916. He then became chief clerk of the purchasing department of the Duluth, South Shore and Atlantic Railroad at Duluth for which he worked until 1918. In that year he joined the Minnesota and Ontario Paper Company as assistant purchasing agent and general storekeeper. He served as general purchasing agent of all M. & O. companies from 1923 to 1931, when he became resident manager at International Falls and Fort Frances. This position he held until 1936, when he became assistant director of paper sales at headquarters in Minneapolis. A year later, he became assistant to the business manager and supervised sales of all M. & O. pulp and paper products. In his present capacity he holds the title of vice-president in charge of sales and will have general supervision over sales activities in all fields.

R. J. HENDERSON, vice-president in charge of traffic, was born at Muskegon, Mich. Attaining manhood, he put in twelve years on the Great Lakes, and in 1907 went to work for the Great Northern Railway. He later worked for both the Northern Pacific and Rock Island Railways. In 1917 he joined the Minnesota and Ontario Paper Company. He worked for the M. & O. as rate clerk, assistant to the 2nd vice-president and assistant to the first vice-president, and, in 1926, was made traffic manager of the company. He has served in that capacity ever since.

R. D. MAIN, secretary-treasurer, was born in Glasgow, Scotland. In 1909 he was admitted to membership in the Institute of Actuaries and Accountants in Scotland. Coming to America, he joined Marwick, Mitchell & Co., accountants. Later he went to work for the Hood Insurance Agency, with which he remained until the World War. From 1917 to 1919, he was with the U. S. Naval Reserves. After the war he returned to Marwick, Mitchell & Co., and remained with this firm until 1921, when he joined the Minnesota and Ontario Paper Company, as comptroller of the company. He served as comptroller until 1931, when he became treasurer of the company, a position retained by him until 1936 when he became secretary-treasurer.

FRANK J. HICKLING, comptroller, was born at Elkhart, Ind. He attended common school; business college at South Bend; the Chicago Walton School of Commerce, and Valparaiso University. In 1915, he got his first job with the Valparaiso, Ind. Lighting Co., and a year later was made office manager of the Elkhart, Ind. Gas Company. When the World War came, he went to France with the 302nd Battalion, Tank Corps, U. S. Army. Returning home, he went with the Valparaiso Lighting Co., but left for La Crosse, Wis., a few months later to become chief clerk of the Wisconsin-Minnesota Light and Power Company. In 1921, he went with the Southern Minnesota Gas and Electric Co., Albert Lea, Minn., as assistant secretary-treasurer. Two years later, he joined the Northern States Power Company, and later served as auditor of stores, first in Minneapolis and St. Paul. In 1924, he went with the Foshay Co., where he worked as general auditor, comptroller and assistant treasurer. In 1930, he went with Harris Upham & Co., Minneapolis, as auditor, and in 1930 joined the Minnesota and Ontario Paper Company as general auditor. He was made comptroller of the M. & O. in 1931, a job he has held ever since.

J. H. DAVIDSON, chief engineer, was born in Maine. In 1918 he enlisted in the heavy artillery and was in service three months, when, at the close of war, he was mustered out of service. He graduated as a civil engineer from the University of Maine in 1921. During vacation times while going to the university, he worked for the Great Northern Paper Company, in Maine, and Hardy S. Ferguson consulting engineers. He began work with the Minnesota and Ontario Paper Company in 1921, on Seine River survey work. He worked, in succession, as draughtsman, designing engineer and assistant engineer, and in 1933 became chief engineer, a position he has held ever since.

J. B. NORMAN, general purchasing agent, was born in Minneapolis. In 1911 he left North High School, after three years schooling, to take a job with the Northern Pacific Railway. When war came he enlisted and was assigned to the Sixth Battalion, 20th Engineers. He was on the Troopship Tuscania, which was sunk off the Irish coast by a German submarine, February 5, 1918, with a loss of 210 lives, but was later rescued. He later arrived in France, and when mustered out of service at the end of the

war was battalion supply sergeant. Returning home, he went back to work at the Northern Pacific Railway and later became division accountant. In 1923 he left the Northern Pacific to become assistant purchasing agent of the Minnesota and Ontario Paper Company. In 1929 he joined Marshall Wells Company and was placed in charge of industrial sales in Minneapolis. He returned to the M. & O. in 1931 as general purchasing agent and has served the company in this capacity ever since.

L. A. FURLONG, director of publishers' sales, was born in Milwaukee, Wis. In 1911 he moved to Minneapolis where he first engaged in the pole and tie business. In 1920 he became affiliated with a company which later, through a consolidation, became the National Pole and Treating Co., a subsidiary of the Minnesota and Ontario Paper Company, in 1926. In 1933, he severed his connection with the National Pole and Treating Company to become director of publishers' sales of the Minnesota and Ontario Paper Company, a position he now holds with the new company.

E. W. MORRILL, general sales manager, Insulite Division, was born in South Dakota in 1897. He later moved to Minneapolis in 1906. Graduating from West High School, in Minneapolis, in 1915, he entered the University of Minnesota. In 1918 he left the university to join the navy. When mustered out of service at the close of the war he was serving as naval aviator with the rank of ensign. After the war, he joined the Fegles Construction Co., of Minneapolis, with which he remained as a structural engineer until 1925, when he went to work for the Insulite Company. During the next four years he served as salesman, sales engineer, manager of the service department, railroad sales manager, sales manager and assistant general manager. In 1929 he joined the Chicago Mill and Lumber Corporation as director of technical service. In 1932, he returned to the Insulite Company as manager of advertising, sales promotion and sales development. He later served as assistant to the vice-president in charge of sales and still later as general sales manager.

COL. C. H. NANCE, manager, foreign sales and operations, Insulite Division, was born in Illinois and attended preparatory school and high school in the San Francisco Bay Region. In 1906 and 1907 he attended the University of California. He graduated from the U. S. Military Academy at West Point in 1911. He served as second and first lieutenants and captain in the Field Artillery, U. S. Army, from 1911 to 1920, with temporary grades of major and Lieutenant-Colonel during the World War, during which he served twenty-two months in the A. E. F. in France, and participated in five major engagements. From 1920 to 1932, he was employed by the Radio Corporation of America, in New York, South America, Europe and in the Far East, as sales representative, representative in South America and Far Eastern manager. He was with Insulite's European organization from 1933 to 1940, as field representative in Europe, manager of advertising and public relations, and general sales manager. He returned to America in 1940 to serve as Insulite's export manager, and later as manager, foreign sales and operations, with offices in Minneapolis, a position he holds at present.

G. F. MCDONALD, sales manager, international lumber division, was born in Parrish, Wis. He attended Carroll College, Waukesha, Wis., for one year. In the fall of 1910 he went to work for the Sawyer-Goodman Company, Marinette, Wis., and worked his way up to the assistant sales managership of the company. On March 1, 1931, the first day of receivership of the old Minnesota and Ontario Paper Company, he became sales manager of the International Lumber Company. He continues in that capacity with the new company.

RONDEAU O. WARNER, manager of merchant sales, with headquarters in Chicago, came to Fort Frances, Ont., Canada, when a boy. In 1910, he joined the Canadian Northern Pacific as clerk, and later was transferred to its timber inspection department. He went with the M. & O. as a night timekeeper, in 1913. In 1916, he was put in charge of the finishing room of the Fort Frances mill, and later of its order desk. In 1919, he went with the Shevlin-Clark Company, at Fort Frances, and in 1921 returned to the M. & O., where he was placed in charge of the order desk. In 1932, he moved to Minneapolis, as assistant sales manager in the newsprint division. He later was assigned to publishers' and merchants' sales, and in 1938, was placed in charge of the Chicago office, where he is stationed at the present time.

D. MCLEOD, vice-president, Kenora Paper Mill, Ltd., was born in New York and was with the old Keewatin Lumbering and Manufacturing Company, predecessor of the Keewatin Lumber Company, before the latter's organization over thirty years ago. He had worked his way up to the managership of the Keewatin Lumbering and Manufacturing Company from the very bottom, having served as a lumberjack, scaler and in other such capacities. He retired as manager of the Kenora mill in 1936 and has served as vice-president ever since.

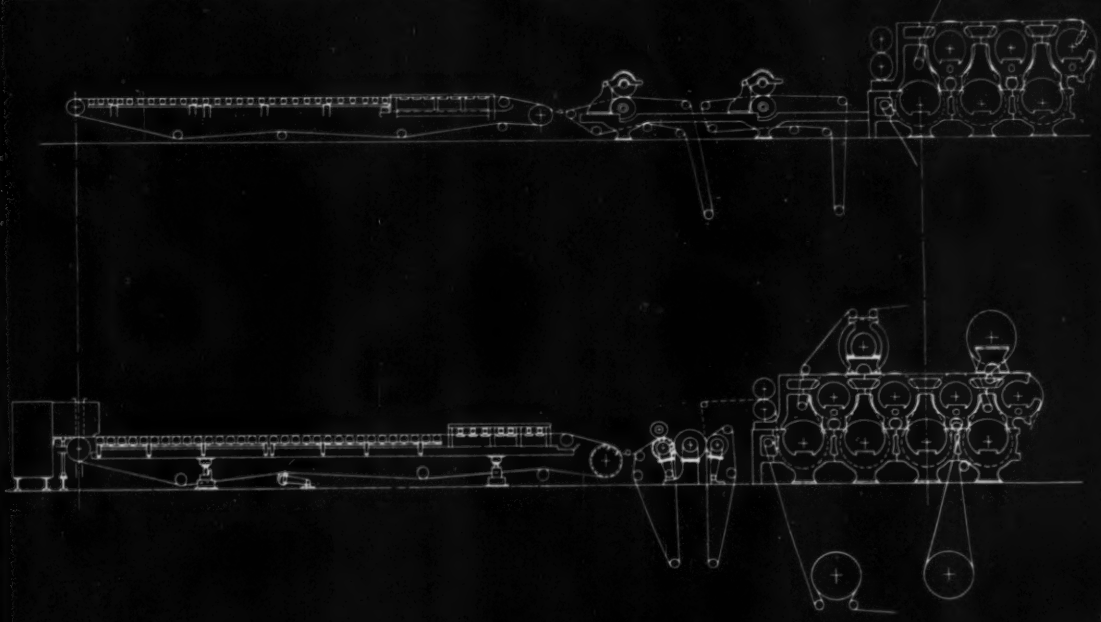
R. BATEMAN, resident manager, Kenora Paper Mills, Ltd., came to Canada from England in 1904, when a young man. He first worked in lumber camps and saw mills in eastern Canada. He went with the Keewatin Lumber Company, Kenora, in 1910, but resigned to enter the Canadian army shortly after the opening of the World War. He went overseas as a lieutenant with the 52nd Battalion, Canadian Infantry, in 1915, and served four years on the western front. He returned home as a major in 1919. Upon his arrival home, he was placed in charge of one of the saw mills of the Keewatin Lumber Co., at Kenora, and later was placed in charge of the Keewatin Box Factory in Winnipeg. Still later, in 1936, he was made resident manager of the mills at Kenora, the position now held by him.

Fire Destroys Algonquin Building

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., March 3, 1941—A building at the Algonquin Paper Company was virtually destroyed by fire last week which for a time threatened the main plant. Equipment consisted of three electric motors and a large steel drum used in washing pulpwood prior to its passing into the grinders and chippers. A large conveyor was also damaged slightly and it was estimated that the loss would be several thousand dollars. Production in the main plant was halted for a time while the fire was at its height. It was stated that the fire would not seriously curtail production at the mill which has been operating twenty-four hours daily. A force is to be placed at work in an effort to salvage the machinery.

This is NEWS!



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Standard Costs in a Paper Mill

By A. A. Hadden[1]

A modern cost system must present figures that are historically correct and must also provide quick and accurate information showing causes for excessive losses (or gains) to guide the executives in their work. It must present front page news, not obituaries. Standard cost is the method used to accomplish this. It has been rapidly gaining ground in most types of industries, whether the job shop, the process industries, or the mass production type of plant is involved. In the paper mill field, there seems to be greater hesitancy than in many others to adopt this cost control plan, even though a number of progressive executives in this industry have used it to great advantage for a number of years. There seems to be some doubt on the part of a considerable group of paper mill executives and operators on two points when standard costs are mentioned,—"Can they be successfully installed in the first place?" and, second, "If installed, what advantages have they over 'actual costs'?"

(1) Inadequacy of Job Costs

The objections to actual or job costs are numerous. They penalize certain runs with charges which should properly be distributed over a greater area of operation, and they subsidize other runs which happen to get lucky breaks. They do not make adequate provision for seasonal variations. Neither do they make due allowance for variations in materials. Nor do they provide a method for automatically evaluating the effectiveness of the amounts expended for each item of cost, nor much less attempt to show gains or losses by specific causes. Furthermore, they do not usually lend themselves to gauging the operating effectiveness by executive responsibilities, as assigned within an organization. They simply record history, blindly and unthinking. Whatever facts they may bring out are too late and too obscure to enable the management to do much about it.

For example, under the "actual" or "job" cost method a small batch of poor materials would make the specific run appear to be expensive, whereas it was only by accident that that particular batch of material happened to be used on that particular run. This type of variation should be considered as a hazard of the entire operation and should be spread over all the production which required that material. Similarly, a machine delay caused by mechanical troubles rather than the nature of the product should not result in a higher cost for the particular job which happened to be on the machine, but should be reflected in the operation of that machine for the period. If the delay were caused by the nature of the product it would be reflected in the standard production cost and therefore anticipated.

Pulp cost may go up but the actual cost plan does not allocate automatically what share of this increase is caused by higher price for which the purchasing department is held responsible, and to what extent excessive quantities have been used in production, which naturally is under the superintendent's jurisdiction.

If the labor cost is high, it does not automatically segregate the excesses by operations as caused by crew size, by overtime costs, by slow machine speed, by excess waste or any number of other causes. And, furthermore, these excess losses (or sometimes profits) are carried into the inventories through the actual cost method, while they obviously should be shown as deductions from or additions to the profit and loss for the period in which they were incurred.

(2) Description of Standard Costs

No attempt has been made to go into the many details of procedure, which will vary according to the specific operation of the mill. The purpose of this article is to set forth the purposes and advantages of standard costs for a paper mill and to demonstrate that it is a practical and useful tool of management.

Space does not permit a complete breakdown of all items of cost to show the extent to which variations may be presented in a standard cost plan. Naturally, the amount involved and the degree of

[1] With McClure, Hadden & Ortman, Inc., Management Engineers, 111 West Washington Street, Chicago.

TABLE II.—MANUFACTURING GAINS AND LOSSES

Standard profit—Table I		$7,596.04
Loss on purchase price of material—Table III (B)	$ 283.65	
Loss on use of material—Table III (C)	1,358.85	
Gain on machine production—Table III (D)	1,324.96	
Over absorbed burden—Table III (E)	272.04	
Loss on operating expenses—Actual hours over std. cost on actual production—Table III (F)	1,509.92	
Net variations		1,555.42
Actual net profit		$6,040.62

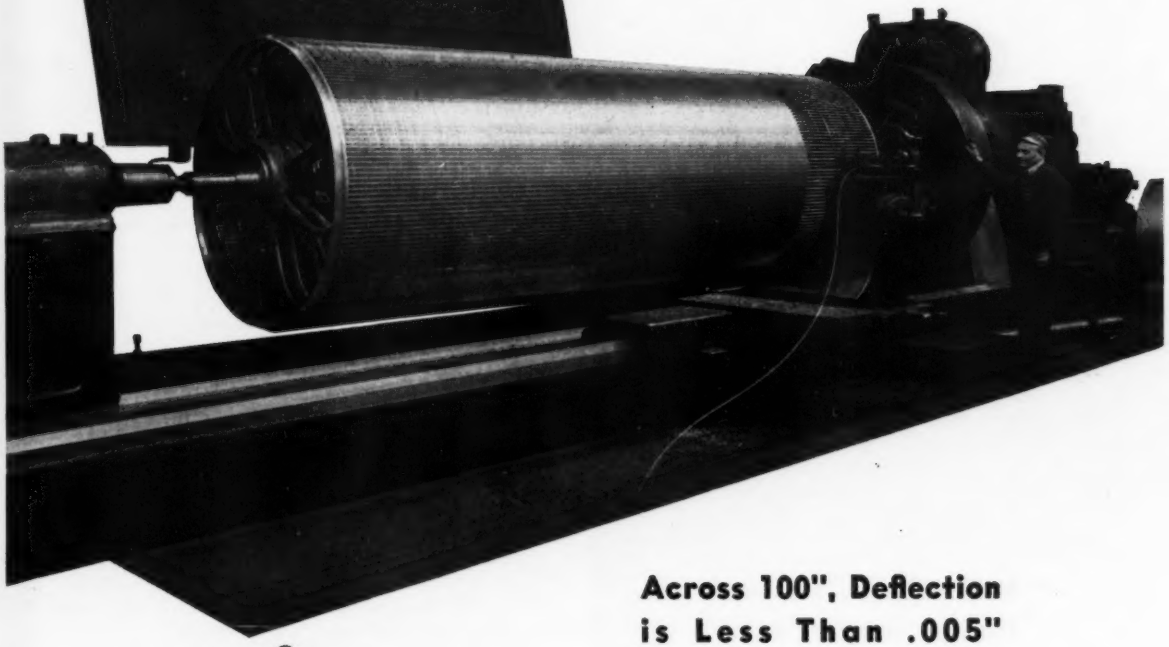
TABLE I.—STANDARD COST AND SALES VALUE OF THE FINISH

Note: All figures are hypothetical and do not remotely resemble any specific mill.

Grade & Weight	No. tons	Std. cost per ton	Std. cost amount	Sales price per ton	Sales amount	Profit or loss
B X 1 20#	156.25	$63.75	$9,960.94	$68.50	$10,703.13	$742.19
B X 2 20#	98.75	67.30	6,645.88	71.50	7,060.63	414.75
C S 1 30#	102.75	64.55	6,632.51	63.75	6,550.31	*82.20*
C S 3 45#	164.50	62.60	10,297.70	62.40	10,264.80	*32.90*
D L 1 28#	83.33	85.90	7,158.05	95.00	7,916.35	758.30
D L 1 32#	77.50	83.65	6,482.88	94.00	7,285.00	802.12
D L 2 28#	255.50	90.62	23,153.41	100.00	25,550.00	2,356.59
D L 2 32[1]	336.67	88.56	29,815.50	98.00	32,993.66	3,178.16
S S 1 18#	43.75	98.25	4,298.44	115.00	5,031.25	732.81
S S 1 22#	56.32	97.35	5,482.75	112.00	6,307.84	825.09
T L 1 45#	283.75	58.50	16,599.38	55.00	15,606.25	*993.13*
T L 2 45#	304.55	56.35	17,161.39	55.00	16,750.25	*411.14*
Total	$1,963.52		$143,688.83		$152,019.47	$8,330.64
Loss due to Deckle—Table III (A)						*734.60*
Mill profit at standard						$7,596.04

DEFLECTION ALMOST NIL

IN THIS STRONG, LIGHT-WEIGHT MOLD



Across 100", Deflection is Less Than .005"

The Black-Clawson heavy-duty cylinder mold is ***built***. Spiders are ***individually clamped*** as the slots for the rods are cut into them. This means that across 100" of width, the deflection is less than .005", an almost negligible amount.

Attention to such details means that you get a superbly built cylinder mold in the Black-Clawson design. Here are some additional features:

Hollow, extra strong shaft on which are mounted fork-tailed spiders. As a protection against corrosion, bronze hubs completely cover the shaft.

Round rods are used. This means less power to turn the mold, a fact proven by actual tests which showed that flat rodded molds take up to five times the power requirements of a round rodded mold.

Rods are locked in place by pinning them against rotation.

Winding wire (stainless, bronze, or Monel) is wound tightly and accurately.

Backing wire cloth and facing wire cloth have welded or sewn seams.

Next Time, Specify Black-Clawson Cylinder Molds.

The Black-Clawson Co., Hamilton, Ohio.
Operators of Shartle Brothers and Dilts.

BLACK-CLAWSON

CYLINDER MOLDS

TABLE III.—VARIATION FROM STANDARD COSTS
Materials and Conversion

Materials	Standard furnish at standard cost: Pounds	Cost per M.	Value	Actual furnish at standard price: Pounds	Value	Gain or loss due to mat. used	Actual furnish at actual rates: Cost per M.	Value	Gain or loss due to price
Fiber									
Pulp #1	675,284	$25.28	$17,071.18	670,395	$16,947.59	$123.59	$25.60	$17,162.11	$214.52
Pulp #2	973,285	17.59	17,120.08	980,674	17,250.06	129.98	17.39	17,053.92	196.14
Pulp #3	1,364,986	20.10	27,436.20	1,289,370	25,916.34	1,519.86	19.90	25,658.46	257.88
Pulp #4	1,031,503	12.80	13,203.24	1,065,345	13,636.42	433.18	13.10	13,956.02	319.60
Broke		10.00		104,037	1,040.37	1,040.37	10.00	1,040.37	
Total fiber	4,045,057		74,830.70	4,109,821	74,790.78	39.92		74,870.88	80.10
Filler & Size									
Clay	309,615	8.62	2,668.88	350,313	3,019.01	350.13	8.75	3,064.53	45.52
Alum	15,291	16.20	247.71	16,740	271.19	23.48	16.00	267.84	3.35
Rosin	32,615	41.52	1,354.17	31,290	1,299.16	55.01	45.60	1,426.82	127.66
Starch	70,745	30.00	2,122.35	106,751	3,202.52	1,080.17	30.32	3,236.24	33.72
Total filler & size	428,266		6,393.11	539,695	7,791.88	1,398.77		7,995.43	203.55
Total materials	4,473,323		81,223.81	4,649,516	82,582.66	1,358.85 (C)		82,866.31	283.65 (B)

	(1) Std. cost at std. rate	(2) Gain or loss on deckle	(3) Std. cost adj. for deckle	(4) Act. hrs. at std. rate	(5) Gain or loss due to mach. prod.	(6) Std. cost on actual prod.	(7) Actual cost on act. prod.	(8) Gain or loss	(9) Gain or loss
Conversion								(4—6)	(7—6)
Beater room.	$8,932.76		$8,932.76	$8,932.76		$8,986.63	$9,161.16	$53.87	$174.53
#1 Machine..	17,854.68	$236.82	18,091.50	17,245.68	$845.82	17,159.45	17,621.28	86.23	461.83
#2 Machine..	16,235.92	319.50	15,916.42	16,213.32	296.90	17,017.36	17,328.54	804.04	311.18
#3 Machine..	18,707.06	817.28	19,524.34	18,748.30	776.04	17,704.58	18,266.96	1,043.72	562.38
	$61,730.42(A)	$734.60	$62,465.02	$61,140.06	$1,324.96(D)	$60,868.02	$62,377.94	$272.04(E)	$1,509.92(F)

controllable variation possible in regard to each cost item will, broadly speaking, determine the account break-down and the variation computations that are desirable.

In this description we will take the summary of a complete manufacturing cost statement as it comes to the executives. For purposes of simplicity, the statement is assumed to cover a mill which purchases all of its pulp. The principles, however, apply equally well to pulp manufacturers.

The first statement shows the profits and losses for each grade and weight derived from the selling prices as compared with the standard costs for each. The significance of this statement is that it shows clearly the initial responsibility for profits or the lack of profits. It also defines and limits the responsibility of the mill manager. His task is to produce the goods specified at, or less than, the standard cost. If he can show a manufacturing gain over standard costs he is to be congratulated, providing, of course, that the standard costs have been correctly set up.

From Table I we can conclude that although the several items vary considerably in their degree of profit, the Company can with reason expect a showing before Selling and Administrative expense of $7,596.04 from the period covered by the statement. Note the picture which this gives the management of the contribution to profit which each line makes.

While DL-2-32#, due to volume, shows the largest total dollar profit, grade S S 1-18# shows the highest profit per ton. Four grades show a combined loss of $1,519.37. Had these grades not been made the profit expectancy might have been enlarged by a similar amount. To what extent this actually would be true, however, can only be determined through an analysis of the detailed cost sheets shown in Table IV, as the burden absorbed by these four grades that would have had to be carried by the

TABLE IV.—PAPER MACHINE COSTS

	Beater Room: Actual	Standard	Machine #1: Actual	Standard	Machine #2: Actual	Standard	Machine #3: Actual	Standard	Total: Actual	Standard	Gain or loss from Standard
Labor											
Direct	$2,411.63	$2,260.00	$4,642.80	$4,550.00	$4,544.37	$4,500.00	$4,806.86	$4,625.00	$16,405.66	$15,935.00	$470.66
Indirect	435.48	440.00	838.37	832.00	820.60	812.00	868.00	845.00	2,962.45	2,929.00	33.45
Supervision	168.40	170.00	324.19	325.00	317.32	325.00	335.64	325.00	1,145.55	1,145.00	.55
Repair labor	337.43	350.00	649.62	650.00	635.84	650.00	672.57	650.00	2,295.46	2,300.00	4.54
Supplies											
Mach. clothing			984.80	700.00	964.53	700.00	947.15	800.00	2,896.48	2,200.00	696.48
Belting	60.83	75.00	117.10	110.00	114.62	110.00	121.23	110.00	413.78	405.00	8.78
Lubricants	36.50	40.00	70.26	75.00	68.77	75.00	72.74	75.00	248.27	265.00	16.73
Repair material	437.95	450.00	843.12	900.00	825.25	900.00	872.92	900.00	2,979.24	3,150.00	170.76
Miscellaneous	255.47	200.00	491.83	400.00	481.40	400.00	509.20	400.00	1,737.90	1,400.00	337.90
Expense											
Power	696.23	700.00	1,340.36	1,355.00	1,311.94	1,338.00	1,387.73	1,375.00	4,736.26	4,768.00	31.74
Coal & fuel (steam)	133.77	150.00	257.53	275.00	252.07	275.00	266.63	275.00	910.00	975.00	65.00
OAB & unemploy. tax	223.30	218.00	429.89	405.00	420.77	410.00	445.08	415.00	1,519.04	1,448.00	
				10,577.00		10,495.00		10,795.00		36,920.00	
Fixed & Pro-rated Charges											
Taxes	197.19		379.62		371.58		393.04		1,341.43		
Fire insurance	42.87		82.53		80.77		85.44		291.61		
Depreciation	617.29		1,188.39		1,163.19		1,230.38		4,199.25		
Total fixed	857.35	857.35	1,650.54	1,650.54	1,615.54	1,615,54	1,708.86	1,708.86	5,832.29	5,832.29	
		5,910.35		12,227.54		12,110.54		12,503.86		42,752.29	
Pro-rated Charges—Table V	3,106.82	3,076.28	4,980.87	4,931.91	4,955.52	4,906.82	5,252.35	5,200.72	18,295.56	18,115.73	179.83
Total mill cost	$9,161.16	$8,986.63	$17,621.28	$17,159.45	$17,328.54	$17,017.36	$18,266.96	$17,704.58	$62,377.94	$60,868.02	$1,509.92
Gain or loss by machines		$174.53		$461.83		$311.18		$562.38			$1,509.92

"A Borg-Warner Product"

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THE LOWER COST OF STAINLESS EQUIPMENT

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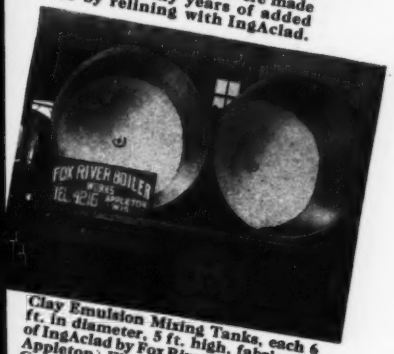
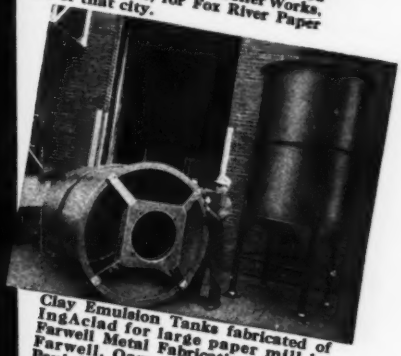
These old Kraft Liquor Tanks were ready for the discard, but were made suitable for many years of added service by relining with IngAclad.



Clay Emulsion Mixing Tanks, each 6 ft. in diameter, 5 ft. high, fabricated of IngAclad by Fox River Boiler Works, Appleton, Wis., for Fox River Paper Co. of that city.



Clay Emulsion Tanks fabricated of IngAclad for large paper mill by Farwell Metal Fabricating Division, Farwell, Ozmun, Kirk & Co., St. Paul, Minn.

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TABLE V.—INDIRECT EXPENSE

	Mill Administration		Warehousing		Storage & Handling		Repairs & Main.		Heat, Light, Power		Total		Gain or loss from standard
	Actual	Standard	Actual	Standard	Actual	Standard	Actual	Standard	Actual	Standard	Actual	Standard	
Salaries & Wages													
Labor	$465.30	$450.00	$1,438.70	$1,550.00	$1,956.70	$2,075.00	$3,438.39	$3,500.00	$1,838.50	$1,800.00	$9,137.59	$9,375.00	$237.41
Supervision	3,895.60	3,895.60	200.00	200.00	250.00	250.00	450.00	450.00	630.00	630.00	5,245.60	5,425.60	.....
Repair labor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Supplies													
Coal and fuel	.....	.....	.....	.....	.....	.....	.....	.....	5,018.90	5,200.00	5,018.90	5,200.00	181.10
Lubricants	.....	.....	.....	.....	.....	.....	131.40	125.00	145.25	125.00	276.65	250.00	26.65
Belting	.....	.....	.....	.....	.....	.....	128.60	185.00	85.40	75.00	214.00	200.00	14.00
Repair materials	.....	.....	.....	.....	.....	.....	3,708.60	3,600.00	.....	.....	3,708.60	3,600.00	108.60
Stationery and postage	187.50	175.00	.....	.....	.....	.....	.....	.....	.....	.....	187.50	175.00	12.50
Miscellaneous	474.20	450.00	.....	.....	.....	.....	.....	.....	.....	.....	474.20	450.00	24.20
Expenses													
Purchased power	.....	.....	.....	.....	.....	.....	.....	.....	1,355.90	1,360.00	1,355.90	1,360.00	4.10
Telephone and telegraph	78.90	75.00	.....	.....	.....	.....	.....	.....	.....	.....	78.90	75.00	3.90
OAB and unemployment	270.62	265.00	185.30	190.00	247.70	250.00	378.40	380.00	256.50	262.47	1,338.52	1,347.47	8.95
Travel	299.50	150.00	.....	.....	.....	.....	.....	.....	.....	.....	299.50	150.00	149.50
Fixed Charges													
Taxes	.....	.....	278.60	278.60	185.00	185.00	195.75	195.75	356.78	356.78	1,016.13	1,016.13	.....
Fire insurance	.....	.....	13.80	13.80	15.60	15.60	40.50	40.50	90.10	90.10	160.00	160.00	.....
Depreciation	.....	.....	79.07	79.07	89.33	89.33	96.26	96.26	259.87	259.87	524.53	524.53	.....
Total indirect	$5,671.62	$5,460.60	$2,195.47	$2,311.47	$2,744.33	$2,864.93	$8,567.90	$8,512.51	$10,037.20	$10,159.22	$29,216.52	$29,308.73	$92.21
Less charged direct	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,920.96	11,193.00	272.04
Total to be pro-rated	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$18,295.56	$18,115.73	$179.83
Gain or loss		$211.02		$116.00		$120.60		$55.39		$122.02			

remaining grades could exceed the losses indicated in Table I. There also might be a necessity from a sales standpoint to make grades at a loss in order to safeguard important customer accounts.

From this Table I it should also be noted that the mill is not held responsible for roll widths which do not come within specified limits for economical production. This is either a sales responsibility for failing to provide the mill with economical widths or combinations of widths, or it may be a top management responsibility for failure to provide machines with capacities which are suitable for the markets it supplies. Possibly changes in market conditions may have made some of the paper machines obsolete. At any rate, the responsibility of the mill manager is limited to getting out the orders given to him in the most economical manner, as reflected by the standard costs. A proper delineation of the causes for losses and a correct measurement of the losses may well be an aid in determining major policy decisions from time to time.

Having thus established the anticipated profit for the company and for the mill operations the next statement (Table II) shows what actually happened and why. It shows that a rise in material prices caused a manufacturing loss of $283.65. It shows that excessive use of certain materials over and above the quantities specified in the standard furnishes cost $1,358.85. It shows that through increased hourly production on the paper machines there was a gain of $1,324.96, also that over absorbed burden resulted in a gain of $272.04, but due to certain expense items being over the budget there was a loss of $1,509.92. And finally, that the mill as a whole showed a loss of $1,555.42. In short, the overall performance was not up to standard.

The details of the mill operation are shown on Tables III and IV and the details of the indirect departments are shown on Table V. It should be noted in connection with Table V that although certain indirect charges can be and are allocated to specific machines (see Table IV) they are also shown under the department which is responsible for their direction and deducted before the balance of the items are pro-rated. This is done so that each indirect department can be made responsible for *all* of the money it spends.

Thus every department head is controlled through standard or budgeted costs and, what is more important, he knows beforehand just what is expected of him. It may be argued that certain contingencies cannot be foreseen and, therefore, cannot be included in or controlled by a standard cost procedure. This argument is put forth as pertaining to both direct and indirect departments. It will be said that fluctuations in water or wood or pulp make it impossible to tell in advance just what steps must be taken to counteract these conditions in maintaining a uniform grade of paper. As a rule, these fluctuations are seasonal and over a period of time an average condition can be established. But, even if it cannot, it is better to have a measurement of what was expected as compared with what actually happened than to have only a record of what happened.

The same is true of indirect expenses, particularly maintenance. The establishment of standard costs requires a program. It requires thinking and planning on the part of the maintenance superintendent.

He should do this anyway but without the stimulus of standard costs he frequently fails to do so.

Briefly, the conclusions which can be drawn from the statements may be summarized as follows:

1. Grades D L and S S are the most profitable and should be pushed, while orders for grades C S and T L should only be taken when tonnage is needed.
2. Utilization of fiber is reasonably good.
3. Filler and sizing consumption is excessive, indicating a condition which should be investigated.
4. Production from the paper machines is good, but the net loss of $1,509.92 in excess of Standard is caused by spending too much money.
5. The greater part of the loss on machine production was caused by excessive labor and machine clothing.
6. Indirect expenditures were fairly well controlled. Mill Administrative travel expense will account for the greater part of the loss. These are indicative of the kind and accuracy of information which can be obtained through standard costs. A wide variety of other information is likewise available to cover specific situations and for varying interests in the management of the business.

It should be explained in connection with the procedure of collecting actual costs to compare with standard that it is no longer necessary to try to record consumption of materials by runs. It is only necessary to know the total amount of each material consumed during the period in order to compare with the total standard quantity for the grades of paper made. This not only simplifies record keeping in the mill and office but it spreads the results of favorable or unfavorable conditions over all of the paper made during the period.

The mechanism of the job cost procedure may be retained if desired so that analyses of individual runs can be made. The importance of this diminishes in the minds of the operating executives as they become more familiar with the standard costs and their utility in the control of all operations.

A standard cost plan can provide gauges covering all items of cost and income and to show in a usable manner the causes and the amount for each gain or loss beyond what should be expected. Naturally, the accuracy of the result depends largely on the care with which the measuring instruments or the standards have been developed. In our experience the development of these standards has never failed to bring forth substantial profit improvements through economies or revised policies. Furthermore, the administrative efforts to maintain the standard cost operation includes a search for opportunities for new standards for greater profits. The standard cost plan, if correctly used, stimulates progress in an orderly way and provides a tangible and intelligent measure on this progress.

The advantages claimed for a standard cost plan are of sufficient importance to warrant serious consideration by every operating executive.

W. C. Mason Made Scott Director

William Clarke Mason, senior partner of the law firm of Morgan, Lewis & Bockius, has been elected a director of the Scott Paper Company. The election of Mr. Mason fills the vacancy on the board created by the death of Clement B. Wood, who was also a partner of Morgan, Lewis & Bockius.

STREAM POLLUTION ABATING

(Continued from page 7)

Company, Park Falls, Wis., $13,744; Lake Superior District Power Company, Ashland and Ladysmith, Wis., $11,494; Cornell Wood Products Company, Cornell, Wis., $4,665. Northern States Power Company, Eau Claire, Wis., $72,283, and Eau Claire Dells Improvement Company, Eau Claire, Wis., $13,361.

Paper Men Reelected

At the annual meeting of the Employers Mutual Liability Insurance Company and the Employers Mutual Fire Insurance Company at the home offices at Wausau, Wis., last week, the following were among the vice-presidents reelected: D. C. Everest, president of Marathon Paper Mills Company, Rothschild, Wis.; Aytch P. Woodson, president of the Mosinee Paper Mills Company, Mosinee, Wis., and secretary of the Wausau Paper Mills Company, Brokaw, Wis., and Charles S. Boyd, president of the Appleton Coated Paper Company, Appleton, Wis. Mr. Boyd and Ben Alexander, president of Masonite Corporation, were re-elected to the board of directors, their terms having expired.

S. F. Shattuck Addresses Meeting

S. F. Shattuck, vice-president of Kimberly-Clark Corporation, was the speaker at a meeting of the Neenah Club, Neenah, Wis., Monday noon of this week. His subject was "Kimberly-Clark Corporation's Experience with the Wisconsin Unemployment Insurance Act."

D. K. Brown on National Committee

D. K. Brown, president of the Neenah Paper Company, Neenah, Wis., has been appointed a member of the national committee on relation of government to industry by Walter D. Fuller, president of the National Manufacturers Association.

Gilbert Employees Hold Party

Approximately 350 persons attended a costume party for employees of the Gilbert Paper Company Sunday evening, February 23, at Germania hall, Menasha, Wis. A. C. Gilbert, president of the company, Mrs. Gilbert and Mr. and Mrs. A. C. Haselow were judges of the costumes during the grand march. Five prizes were awarded for the best characterizations, and numerous others for novel outfits.

Simplification of Corrugated Rolls

The proposed simplification of sizes and weights for single-faced corrugated board rolls used in the packaging and wrapping of commodities, has been accorded the required degree of acceptance, and approval for promulgation, according to an announcement of the Division of Simplified Practice, National Bureau of Standards. The program is designated "Simplified Practice Recommendation R177-41, Single-faced Corrugated Board Rolls," effective from January 1, 1941.

This recommendation was developed by a joint committee of manufacturers and the National Retail Dry Goods Association, as a first step in the simplification of this type of packaging material, following a variety-survey.

Obituary

A. F. Tuttle

APPLETON, Wis., March 3, 1941—A. F. Tuttle, 77, president and founder of the Tuttle Press Company of this city, died unexpectedly at 5 o'clock February 27, in his apartment at Los Angeles, Calif. Mr. and Mrs. Tuttle had gone there by automobile earlier in the month to spend several weeks.

The body was conveyed back to Appleton, where funeral services were to be held Tuesday afternoon of this week at the First Congregational Church, of which he had been an officer and member for many years. The service was to be conducted by the Rev. Dascomb E. Forbush, pastor. Burial is to be made at Elgin, Ill.

Mr. Tuttle was born in 1864 at Kalamazoo, Mich., and he moved to Chicago when a young man, where he learned the printing trade. A few years later he went to Elgin, Ill., where he was employed by the David C. Cook Publishing Company.

While at the World's Fair in Chicago in 1893, Mr. Tuttle saw an exhibit of paper napkins and fruit wrappers in two colors, and became interested in developing a press for printing on tissue paper. He finally perfected such a machine and in 1898 formed the Tuttle Press Company at Elgin to build the presses. After building half a dozen he put them into operation, but moved his plant in 1902 to Appleton so he would be near his source of paper supply, the former Wisconsin Tissue Mills. His business partner in these earlier years was S. A. Wheadon. Today the Tuttle Press Company is one of the largest converters in the tissue field, and is closely affiliated with the Northern Paper Mills, Green Bay, Wis., of which Mr. Tuttle was a director.

When the Y. M. C. A. in Appleton was first founded, Mr. Tuttle was its first treasurer and served in that capacity for 20 years. He has continued to serve as an honorary member of the board of directors. He was also a trustee of Lawrence College at Appleton for many years, and on retirement was made an honorary trustee. He was active in Masonic circles as a member of Waverly Lodge, Royal Arch Chapter, Appleton Commandery, Consistory and Shrine, and treasurer of Appleton Masonic Temple Association. He was also a member of the Rotary Club.

Survivors are his widow; a nephew, Frank Tuttle, Akron, Ohio, and a niece, Mrs. David O. Anderson, New York.

W. C. Jephcott

TORONTO, Ont., March 3, 1941—Vice-president and secretary-treasurer William C. Jephcott, of the Dominion Paper Box Company, Ltd., died at his home here on February 25 at the age of 80 years.

Born in Birmingham, Eng., the late Mr. Jephcott came to Canada in 1890 and for years was associated with the late Wm. Stone and the late Fred Heath in the Toronto Lithographing Company and later with his brother, the late Alfred Jephcott, in the paper box business.

John F. Adie

John F. Adie, 72, paper manufacturer and former president of the Holyoke Chamber of Commerce, died February 25 at his home, 165 Morgan street, Holyoke, Mass., of a heart attack.

Born in Scotland, he came to this country in 1891 where he rose to an executive post in a New York chain store. He became associated in 1916 in this city with the Taylor-Logan paper firm and, on the death of James G. Taylor, president, in 1918, he became the head of the firm. He was also president of the New York-New England Paper Company.

His widow, a daughter, Mrs. Wilson Haight of New York, and a son, Douglas, a member of the naval reserve force at the Boston navy yard, survive.

William I. Atherholt

William I. Atherholt, of 105 Trites avenue, Norwood, Pa., a salesman for the Mather Paper Company, Philadelphia, Pa., died during the week in Hahnemann Hospital after a long illness. Mr. Atherholt was well and favorably known in the paper trade and his passing is deeply felt by all those who were privileged to know him.

Besides his widow, Stella F. Atherholt, he is survived by a son, Gordon, and two daughters, Florence and Norma. Services were held on Saturday last at the Griffith chapel, Norwood, with Rev. Albert Wilcox, rector of St. Stephen's Church, officiating. Burial was private.

Delaware Valley Paper Shipments Up

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 3, 1941—To Dill & Collins goes first honors for having shipped the highest tonnage during 1941, according to figures just released by the Delaware Valley Paper Shippers Association, having shipped 4,593,189 lbs. The Delaware Valley Paper Shippers' Association, as reported in these columns a few months ago, is a voluntary organization of paper mills, converters and merchants who pool their products for shipment to all parts of the country. Dill & Collins are pioneers in this group, having laid the ground work to undertake the loading of numerous cars to various points, thereby bringing about an immeasurable improvement in service to customers which has resulted in the steady increase of their pool car shipments, thus enabling the individual mills to load all cars which serves to keep down costs to carload rates.

Other mills in the Association shipping more than 1,000,000 pounds are: W. C. Hamilton & Son, 2,758,331 lbs.; Thos. M. Royal & Co., 2,266,245 lbs.; Paterson Parchment Paper Company, 2,105,508 lbs.; Riegel Paper Corporation, 1,764,128 lbs., and Benjamin C. Betner, 1,361,491 lbs.

W. G. Shortess Given Gold Pocket Piece

On the occasion of the twenty-fifth anniversary of the founding of the Federal Paper Board Company, Inc., located at Bogota, N. J., William G. Shortess, president, was presented with a gold pocket piece, by those associated with him since the inception of the company.

The pocket piece was symbolic of the progress of the company; was engraved, and set with an emerald, ruby, sapphire, brown diamond and topaz.

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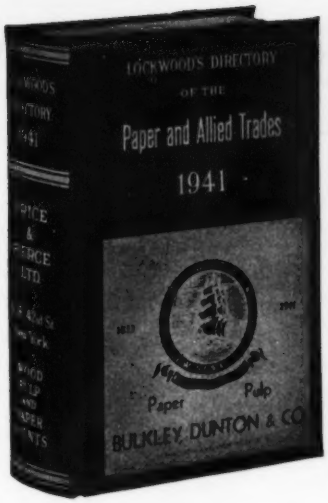

LOCKWOOD'S DIRECTORY OF THE PAPER AND ALLIED TRADES

1941 - 66th Annual Edition - 1941

Published By

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PAPER AND PULP MILL SECTION

Geographically arranged by states

Reports of the paper, ground wood pulp and chemical fibre mills located in the United States, Canada, Cuba, and Mexico. Also the Glazed, Coated Paper and Board Manufacturers.

These reports include name of company. Location of mill. Names of officers and their connections and operating executives.

It is indicated whether the plant is a paper mill, ground wood mill, sulphite, sulphate, or a soda pulp mill.

Type of mill equipment. Kind of power used, whether water, steam or electricity.

KIND OF PULP AND PAPER manufactured. Total production in pounds per 24 hours.

Shipping point, railroad siding, post office, nearest bank, money order and telegraph office. Population.

MILL OFFICIALS—Separate list alphabetically arranged.

MILL PRODUCTS—Classified—alphabetically arranged.

Reports of the Paper and Pulp Mills of South America and Trinidad.

ADDITIONAL MILL INFORMATION

CITY ADDRESSES—Mill or mill agent in some of the principal cities of the United States and Canada.

RAW MATERIALS—Classified and arranged in alphabetic order. The kinds and grade of paper stock and rags consumed by the different mills including names of the purchasing agents.

PAPER AND PULP MILL MACHINERY, EQUIPMENT AND SUPPLIES—*A classified (alphabetical) list of the different kinds of machinery, equipment and supplies used by the pulp and paper mills including the name and address of the manufacturers.*

CONVERTERS' SECTION

Manufacturers of Paper Specialties

A classified list (alphabetically arranged) of products made from paper, cardboard, etc., such as drinking cups, mailing tubes, napkins, toilet paper, towels, wrapping specialties, etc. This is an extensive list.

The name and address of the manufacturer is included.

Separate Lists of Concerns (Geographically arranged) manufacturing the following products.

ENVELOPES—Concerns manufacturing commercial envelopes.

PAPER BOXES—Keyed to show whether stiff, folding or corrugated boxes are made, also whether suit, millinery, confectionery, etc., etc.

PAPER BAGS — PREPARED ROOFING

TABLETS AND PADS — TWINE

TAGS — PAPETERIES

VEGETABLE PARCHMENT AND WAXED PAPER

ADDITIONAL SECTIONS

PAPER DEALERS—Geographically arranged and keyed to show the

**General Paper Dealers who maintain Stores.* †*Member National Paper Trade Association.* s *Dealers who sell from Storage, Warehouses or from Mill direct.* sl *Merchants in other lines who carry paper as a side line.* b *Brokers.* br *Those Concerns that are Branches of Houses located elsewhere.* f *Fine Paper.* w *Wrapping Paper.* f.w. *Fine and Wrapping Papers.*

RAGS AND PAPER STOCK DEALERS—Keyed to show kind of stock handled. Importers are included.

WALL PAPER PRINTERS — PULP TESTING CHEMISTS

WOOD PULP IMPORTERS — TRADE ASSOCIATIONS

STATISTICAL INFORMATION

WATERMARKS AND BRANDS—*Alphabetical list of Watermarks and Brands used in the American Paper Trade. Names of owners are included. This list is restricted to papers of various kinds—converted products are not included.*

SPECIAL TRAVELER'S EDITION—A limited number of copies, pocket size, for use of traveling men, Mill Section only, including the reports of the Paper and Pulp Mills, the Coating Mills, the list of Mill Officials and index to the Mills. These copies are bound in thin fabrikoid leather covers. Price $7.50, including delivery charges. ($7.00 *cash with order.*)

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March 6, 1941

CONSTRUCTION NEWS

Louisville, Ky.—The Mengel Company, Fourth and G streets, manufacturer of corrugated and other boxes and containers, has approved plans for one-story addition to mill at 415 West Colorado street, reported to cost about $25,000, with equipment. Erection will be placed under way at once and will be carried out by day labor.

Oakland, Cal.—The Gaylord Container Corporation, 2820 South 11th street, St. Louis, Mo., manufacturer of corrugated boxes and containers, has awarded contract to the Superior Structural Steel Company, 5100 Farlin street, St. Louis, for structural steel framing for new branch plant at Oakland, where tract of land was purchased recently, as noted in these columns, totaling about five acres. Erection will be placed under way for superstructure at early date. It will comprise a main one-story production building, with several auxiliary structures, including space for storage and distribution. Cost is reported close to $500,000, including equipment.

St. Louis, Mo.—Reynolds Metals Company, 1221 Locust street, St. Louis, manufacturer of tin, aluminum and other metal foils, has arranged for lease of part of large building at Lucas avenue and Seventh street, and will use for expansion in foil production and converting plant, including facilities for the manufacture of foil labels, with gravure printing division. Space will be taken over at once, with installation of machinery and equipment estimated to cost over $100,000. It is said that at a later date company plans an entirely new local plant for its foil department, to cost in excess of $750,000 with equipment.

New Haven, Conn.—The National Folding Box Company, James and Alton streets, manufacturer of folding and other paper boxes and containers, has asked bids on general contract and will make erection award soon for proposed new addition to plant, recently referred to in these columns. It will be two-story, instead of one-story, as previously announced, 50 x 250 ft., and is reported to cost close to $85,000, with equipment. Fletcher-Thompson, Inc., 1337 Fairfield avenue, Bridgeport, Conn., is architect and engineer.

Ogdensburg, N. Y.—Fire recently damaged a portion of mill of the Algonquin Paper Company, manufacturer of newsprint, etc., originating in tumbler house, with loss reported at about $17,000. The damage will be replaced at early date.

Waterbury, Conn.—The Waterbury Paper Box Company, 155 South Leonard street, manufacturer of stiff paper boxes and containers, has completed plans for alterations and improvements in building used for storage and distribtuion, and will proceed with work at once. No estimate of cost announced. Henry T. Moeckel, 35 Hillcrest avenue, Naugatuck, Conn., is architect.

Clinton, Iowa—E. I. duPont deNemours & Co., Inc., Cellophane Division, duPont Building, Wilmington, Del., has completed construction of new mill at Clinton, in course of erection for a number of months and previously referred to in these columns. Plant consists of several large units and will be placed in operation at once, with output designed primarily for the food industries in the Middle West districts. New mill is reported to represent an investment in excess of $2,000,000, with equipment.

Worcester, Mass.—The Vellumoid Company, 54 Rockdale street, manufacturer of paper specialties, has taken out a permit for erection of a one-story addition to mill, about 30 x 60 feet, for expansion in storage and distributing department, and will proceed with erection at once. No estimate of cost announced. Albert J. Daniels, 661 Main street, Shrewsbury, Mass., is architect.

Rome, Ga.—The Tubize Chatillon Corporation, 2 Park avenue, New York, N. Y., manufacturer of viscose rayon products, is completing plans and will take bids soon for superstructure for proposed additions to branch mill at Rome, previously referred to in these columns, to provide for large expansion in production division. It is expected to begin work in April. Cost reported over $500,000, with machinery. Foundations for new buildings are now being laid by the A. K. Adams Company, 542 Plum street, N.W., Atlanta, Ga., which recently secured award for this work. Robert & Company, Atlanta, are architects and engineers.

Portland, Conn.—The Robert Gair Company, 155 East 44th street, New York, N. Y., manufacturer of corrugated boxes and containers, has awarded contract to J. Warren Mylchreest, 33 Brainerd street, Middletown, Conn., for alterations in part of branch plant at Portland, and will proceed with work at once. No estimated cost announced.

Fort Wayne, Ind.—The Wayne Paper Box and Printing Corporation, Superior and Calhoun streets, manufacturer of folding paper boxes and containers, etc., has begun work on new four-story addition to plant, 70 x 116 feet, previously referred to in these columns, and expects to have structure ready for occupancy early in the summer. It will be equipped for expansion in production division and is reported to cost in excess of $100,000, including equipment. The Hagerman Construction Company, 402 East Superior street, has the general erection contract. Pohlmeyer & Pohlmeyer, Central Building, are architects.

New York, N. Y.—The Brooklyn Standard Bag Corporation, foot of Van Dyke street, Brooklyn, manufacturer of paper bags, will remove its executive and sales offices from 295 Madison avenue, New York, to building at 521 Fifth avenue, where large increase in space and facilities will be provided.

New Companies

Newark, N. J.—The United Manufacturing Company has been chartered with capital of 100 shares of stock, no par value, to manufacture paper products of various kinds. New company is represented by Albert M. Neiss, 744 Broad street, Newark, attorney.

Philadelphia, Pa.—The American Paper Box Company, 203 Cuthbert street, has filed notice of organization to manufacture and deal in paper boxes and containers. Company is headed by Edwin M. Plato, 317 West Berks street; and Sidney B. Bregman, 27 West Sixty-third street, Philadelphia.

Newark, N. J.—The Precision Paper Products, Inc., has been incorporated with capital of 500 shares of stock, no par value, to manufacture and deal in paper goods of various kinds. New company is represented by Frederick H. Samuels, 1172 Raymond boulevard, Newark, attorney.

Metuchen, N. J.—Fine Pigments, Inc., has been chartered with capital of 5,000 shares of stock, to manufacture and deal in pigment specialties for the paper trade and allied service. New company is headed by Harold T. Edgar, president, Edgar Brothers Company, Metuchen, producer of coating and filling clays for paper, and other purposes.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

William H. Aiken, student, Institute of Paper Chemistry, Appleton, Wis.

Lee M. Bauer, production supervisor, Ecusta Paper Corporation, Pisgah Forest, N. C.

Charles E. Bertschy, assistant plant manager, Hummel & Downing Company, Milwaukee, Wis., a 1917 graduate of Beloit College.

Eugene H. Clapp, 2nd, accountant and production research, Penobscot Chemical Fibre Company, a 1936 graduate of Lafayette College.

John F. Corwin, research chemist, Casein Company of America, Bainbridge, N. Y., who received his PhD. degree from Yale University in 1937.

Edward Engel, technical service engineer, General Chemical Company, Edgewater, N. J., has been transferred from the associate to the active grade.

Andrew G. Engstrom, sales manager, the Glidden Company, Chicago, Ill., a 1932 graduate of Lawrence College.

George E. Fromm, technical service, American Cyanamid and Chemical Corporation, New York, N. Y., a 1933 graduate of Ohio State University and was formerly with the Mead Corporation, Chillicothe, Ohio.

Edward P. Gillan, technical director, Anheuser-Busch, Inc., St. Louis, Mo., was formerly with the Chicago Starch Company, Chicago, Ill., and Paisley Products Inc., Chicago, Ill.

Howard W. Hall, research and sales engineer, the Dicalite Company, New York, N. Y., a 1933 graduate of Stanford University was formerly with the Sterling Chemical Company, Los Angeles, Cal.

Philip J. Hannan, chief chemist, Southern Advance Bag and Paper Company, Hodge, La., a 1924 graduate of Holy Cross College.

L. S. Hatch, assistant manager, Penobscot Chemical Fibre Company, Great Works, Me., graduate from the University of Maine in 1922 and was formerly with the Advance Bag and Paper Company, Howland, Me.

Charles F. Jameson, treasurer, C. F. Jameson & Co., Inc., Haverhill, Mass., a 1915 graduate of Tufts College.

Joseph A. Jenemann, supervisor of sales service, Grasselli Chemicals Department, E. I. du Pont de Nemours & Co., Wilmington, Del., a 1922 graduate of the University of Pennsylvania.

Robert W. Laughlin, resident engineer, Liberty Mutual Insurance Company, Portland, Me., a 1922 graduate of the University of Maine and was formerly with the General Electric Company, Schnectady, N. Y.

Erik G. Linden, research chemist, Clover Manufacturing Company, Norwalk, Conn., a 1938 graduate of Columbia University Engineering School.

George L. Nystrom, Jr., student, University of Maine, Orono, Me.

Gilbert F. Parks, general superintendent, Fitchburg Paper Company, Fitchburg, Mass.

Michael N. Planidin, laboratory assistant, Canada Paper Company, Windsor Mills, Que., a 1933 graduate of the University of Saskatchewan was formerly with McGill University, Montreal, Que.

A. C. Salisbury, Paraffine Companies Inc., Emeryville, Cal., a 1924 graduate of Oregon State College and was formerly with the Fir-Tex Insulating Board Company, St. Helens, Ore.

Ralph E. Sheffer, chief plant metallurgist, Aluminum Company of America, New Kensington, Pa., a 1925 graduate of Purdue University.

Clark E. Snook, chemist, National Oil Products Company, Harrison, N. J., a 1940 graduate of New York State College of Forestry.

Gerald L. Swope, assistant to the manager, American Can Company, New York, N. Y., was formerly assistant chief chemist with W. Virginia Coal and Coke Corporation, W. Va.

Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 5, 1941—Nashua Gummed and Coated Paper Company has been awarded the contract for furnishing the Government Printing Office with 10,000 sheets of 24 x 36 brown cloth lined paper at $101.25 per 100 sheets less 2%, bids for which were received on February 10.

R. P. Andrews Paper Company will furnish 216,290 pounds of white M. F. book paper in 38 inch rolls at 4.95 cents. Paper Corporation of the U. S. will furnish 45,600 pounds (600,000 sheets) of 22¼ x 32¼ M.F. book paper at 4.87 cents. Aetna Paper Company will furnish 40,000 pounds of 50% rag, white bond paper in 32 inch rolls. Bids for these items were received on February 7.

Paper Corporation of the U. S. will furnish 2,910 pounds (15,000 sheets) of 21 x 32½ buff sulphite index paper at 6.9 cents, bids for which were received on February 5.

Barton, Duer & Koch Paper Company will furnish 1,015 sheets of 17 x 22 artificial parchment paper at $48 per 100 sheets, bids for which were received on January 31.

R. C. Alden Goes With Watervliet

KALAMAZOO, Mich., March 3, 1941—Richard C. Alden of Rumford, Maine, formerly with the Oxford Paper Company, has been named to the new position of assistant superintendent of the coating department of the Watervliet Paper Company. Elbert G. Milham, the superintendent of that division will devote more of his time in the research laboratory, in the development of new printing papers, a study he has been interested in for some time.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending March 5, 1941

	High	Low	Last
A. P. W.	1½	1½	1½
Armstrong Cork Co.	29¾	29	29½
Celotex Corp.	9¼	8¾	8¾
Celotex Corp., pf.	68½	68½	68½
Certain-Teed Products Corp.	4⅛	3⅞	3⅞
Certain-Teed Products Corp., pf.	28½	27	28
Champion Paper & Fibre Co.	19	18¼	18½
Champion Paper & Fibre Co., pf.	105	104¾	104½
Congoleum-Nairn Co.	17¾	17	17½
Container Corp. of America	14¾	14	14
Continental-Diamond Fibre Co.	8¼	7½	8
Crown-Zellerbach Co.	13½	13	13½
Crown-Zellerbach Co., pf.	87½	86¾	86¾
Flintkote Co.	13¾	13¼	13⅜
Robert Gair	2¼	1¾	2
Robert Gair, pf.	18¼	15¼	17
International Paper & Power	14¾	12⅞	13¾
International Paper & Power, pf.	66⅞	62½	64¾
Johns-Manville Corp.	58½	57	57
Johns-Manville Corp., pf.	127	126½	126½
Kimberly-Clark Corp.	....	....	....
MacAndrews & Forbes	28⅞	28¾	28¾
MacAndrews & Forbes, pf.	135	134	135
Masonite Corp.	25	25	25
Mead Corp.	8⅛	7¾	8
Mead Corp., pf.	66	66	66
Paraffine Companies, Inc.	30¼	30¼	30¼
Paraffine Companies, Inc., pf.	101	101	101
Rayonier, Inc.	14	13¼	13⅞
Rayonier, Inc., pf.	28	26½	28
Ruberoid Co.	16⅝	16	16⅝
Scott Paper Co.	36¼	36	36¼
Scott Paper Co., pf.	108⅛	108	108⅞
Sutherland Paper Co.	22	20¾	21
Union Bag & Paper Corp.	11½	10½	10⅝
United Paperboard Co.	3⅜	3	3
U. S. Gypsum Co.	62¼	61½	61⅝
U. S. Gypsum Co., pf.	175	173½	173½

New York Curb Exchange

High, Low and Last for Week Ending March 5, 1941

	High	Low	Last
American Box Board Co.	5¼	4⅝	5¼
Brown Co., pf.	14	14	14
Great Northern Paper	40	40	40
Hummel-Ross Fibre Corp.	6	5½	5½
National Container Corp.	11½	11	11
St. Regis Paper Co.	2⅜	2	2
St. Regis Paper Co., pf.	77½	73	74
Taggart Corp.	3⅛	2⅞	2⅞

Provincial Makes Good Report

TORONTO, Ont., March 3, 1941—Provincial Paper, Ltd., whose common stock is completely held by Abitibi Power and Paper Company, Ltd., reports for the year ending December 31, 1940, a net profit of $273,316, after all charges, including Dominion and Provincial income taxes, excess profits tax, depreciation, etc., which is equal to $7.80 a share on 35,000 shares of 7% preferred stock ($100 par) outstanding and after preferred dividend requirements of 28 cents per share on 100,000 shares of common stock. This compares with net profits of $343,748, equal to $9.80 on preferred and 98 cents on common in the previous year.

Operating profit for the year was $1,056,194, compared with $935,748. Dominion and Provincial taxes were $280,000, against $105,000 in 1939.

The balance sheet shows current assets of $3,478,936 and current liabilities of $603,510, leaving net working capital of $2,875,426. This compares with net working capital of $2,803,954 in the previous year. Cash was $581,325, against $1,050,508; receivable, less reserve, $882,398, against $985,412; inventories, $1,515,737, against $1,228,842, and estimated reserve for Dominion and Provincial income and excess profits taxes, $304,388, against $117,445 in the previous year. Surplus at the end of 1940 was $1,130,255, against $1,102,039.

Crown Zellerbach Nets $1.62

The Crown Zellerbach Corporation and its subsidiaries report for the nine months ended on January 31 a net profit of $5,657,933, equal, after preferred dividends, to $1.62 a share on 2,261,199 shares of common stock outstanding. This compares with $5,797,632 or $1.68 a share, for the comparable period of the previous year.

Provision for United States and Canadian income and excess profits taxes for the period totaled $5,404,857, compared with $1,555,838 for the previous period.

Sales for the nine months amounted to $49,383,401, against $41,715,622. Consolidated profits before taxes, after giving effect to minority interests, amounted to $11,062,790, as compared with $7,353,467.

In the first nine months of its current year $3,800,000 of the company's long-term bank loans were paid off, and an additional $1,000,000 of the loans were paid since January 31, 1941. This brings total payments during the current fiscal year to date to $4,800,000 and reduces the amount of the loans still outstanding to $9,000,000.

Consolidated net profit for the quarter ended on January of totaled $1,820,958, of 51 cents a common share, against $1,886,315, or 54 cents a share in preceding quarter and $2,134,650, or 65 cents a share, for the three months ended on January 31, 1940.

Rayonier Earns $2.17

Rayonier, Inc., reporting for the nine months to January 31, showed a consolidated net profit of $3,031,953, equal to $2.17 each on the 963,871 shares of common stock outstanding, after allowing for dividend requirements on the preferred stock. This result compares with $1,425,193, or 50 cents a share for the corresponding period of the preceding fiscal year.

In the first nine month of the current fiscal year the company paid dividends of $2,504,820, or $4 a share on the preferred stock, eliminating all accruals and placing the issue on a current dividend basis. In addition, Rayonier prepaid $1,000,000 of its long-term bank loans and a further prepayment of $500,000 was made as of February 10, this year. This reduced the outstanding long-term loans to $5,000,000.

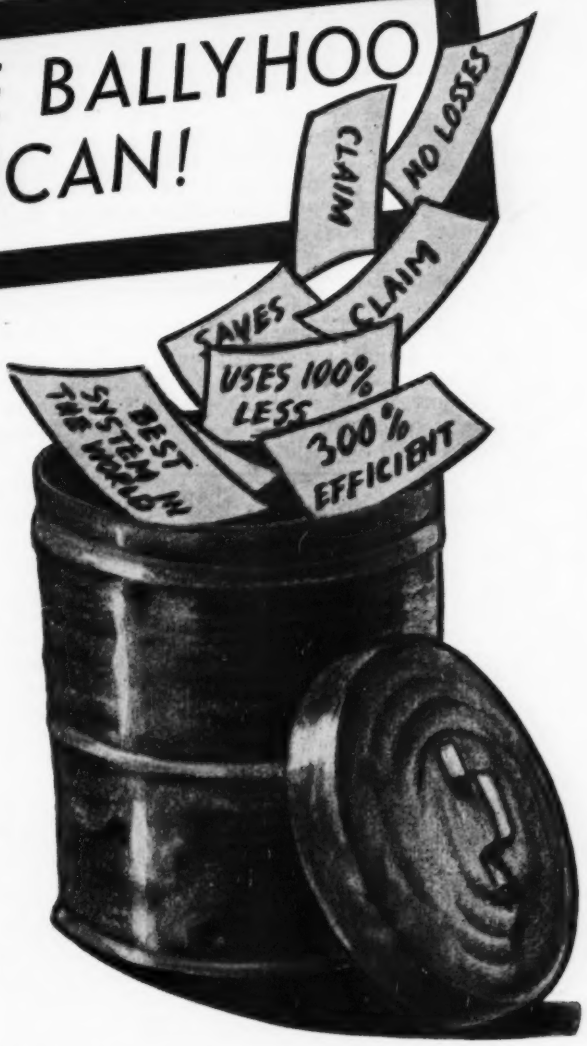
For the quarter to the end of last month, the net profit was $892,844, or 60 cents a share, compared with $555,041, or 25 cents a share for the January quarter in 1940.

Container Corp. Profits Rise

The Container Corporation of America and its subsidiaries reports for 1940 a net profit of $2,227,682 after depreciation, depletion, loss on capital assets retired, interest, amortization, Federal income and excess profits taxes, according to the annual report issued by Walter P. Paepcke, president.

Profit is equal to $2.85 a share on 781,253 shares of

LET'S TOSS THE BALLYHOO INTO THE ASHCAN!



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3. Equipment used is rugged and dependable.
4. Moderately priced.
5. Easily installed.
6. Tailored for each individual machine.
7. Maintenance expense is low.
8. Equipment furnished for all types and ages of paper machines.

IN view of the above facts, it is not surprising that users seem to be well pleased with the performance of their Armstrong-Stamm Drainage Systems. In fact, some go so far as to give our system credit for increased production or decreased steam consumption. If you are contemplating any changes in your drainage systems, why not ask for details on the Armstrong-Stamm System? To do so involves no obligation on your part. Just write the Paper Mill Division of the Armstrong Machine Works, 1818 Hoffman St., Three Rivers, Michigan.

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$20 per capital stock, and compares with $1,448,900, or $1.85 a share earned in 1939.

Consolidated net sales in 1940 amounted to $30,464,677, an increase of 26 per cent over the $24,114,815 in 1939.

The balance sheet for December 31, last, shows current assets of $7,836,469 and current liabilities of $2,365,784, compared with $6,592,559 and $1,882,983, respectively, at end of 1939. Cash was increased to $2,456,532 from $1,044,918, and net working capital was up to $5,470,685 from $4,709,576.

Funded debt was reduced by $1,276,000, the report said. Additions to plant and equipment amounted to $1,266,789.

At the annual meeting stockholders will vote on a retirement annuity plan for all employes, both factories and offices, and also on the authorization of a $5,000,000 preferred stock issue, the proceeds of which will be used to retire the balance of the bank credit of $3,950,000 and for additional working capital.

MacLaren Shows Marked Improvement

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 28, 1941—The annual report of the Maclaren Power and Paper Company and its subsidiaries, Maclaren-Quebec Power and the James Maclaren Company (newsprint), for the year ended November 30, shows a marked improvement in operating results, net before taxes amounting to $511,905, as compared with $79,222 in the previous fiscal year. Of this James Maclaren unit contributed $660,528 with a loss for Maclaren-Quebec of $148,623.

The latter company for 1938 showed a loss of $621,809. Maclaren Power & Paper has 500,000 shares of no par common stock.

The balance sheet shows bank loan and overdraft of $1,261,454, with total current assets of $2,195,064. The auditors' report states that a substantial amount owing by one of the largest customers of the James Maclaren Co. is represented in the accounts at 50 per cent face value.

A. P. W. Loses $75,483

The A. P. W. Paper Company, Inc., report from July 1, 1940, to January 11, 1941, a loss of $75,483 after interest on funded debt, notes, acceptances and other charges. No provision was made for noncumulative income interest on the $760,769 par-value of twenty-five-year 6% convertible notes, assented. No provision was included for additional contingent interest of 1% on first mortgage bonds, with warrants (maximum annual requirement of $10,970 payable only if earned). In comparable period of preceding year profit was $46,369 after accruing full interest on twenty-five-year 6% notes.

Ft. Wayne Co. Elects Officers

Officers of the Fort Wayne Corrugated Paper Company, Fort Wayne Ind., were reelected and one new director was elected at the annual meeting of the concern yesterday afternoon at the chamber of commerce.

The new director is August F. Stahlhut, assistant secretary, who has been associated with the company for 23 years. Mr. Stahlhut fills a vacancy on the board created last year by the death of George D. Stevens of Hartford City.

Henry J. Bowerfind was re-elected chairman of the board. Other officers renamed were: Frank P. Koester, president and treasurer; Harold M. Treen, vice-president, general manager and secretary; J. N. Johnston, assistant treasurer and controller, and Mr. Stahlhut, assistant secretary.

Directors re-elected were Mr. Bowerfind, James M. Barrett, Jr., James H. Haberly, W. S. O'Rourke, Jr., Mr. Koester and Mr. Treen.

The annual report of the company was given by Mr. Treen and showed a large increase in business during the past year.

W. H. Chatfield Heads Scioto Paper Co.

W. H. Chatfield of Cincinnati, Ohio, was re-elected as president of the Scioto Paper Company, 407-23 N. Grant avenue, Columbus, Ohio, at the annual meeting of the company held recently. Other officers renamed were Arthur J. Ulrich, treasurer and general manager, and D. Y. Johnson of Cincinnati, secretary. Members of the board of directors include Mr. Chatfield, Mr. Ulrich, Mr. Johnson, C. C. Hinterscied, and R. W. South, both of Columbus.

Hummel-Ross Nets $1.34

The Hummel-Ross Fiber Corporation for 1940 reports a net profit after excess profit taxes of $566,628, equal after 6 per cent preferred dividends to $1.34 each on 391,706 shares of $5 par common stock, excluding treasury shares. Net profit in 1939 was $192,144, or 39 cents each, on 389,636 common shares.

Provincial Profits Lower

Provincial Paper, Ltd., (Canada) for 1940 reports a net profit of $273,216 after excess profits taxes. This is equal after dividend requirements on preferred, to 28 cents each on 100,000 shares of common stock, all of which is owned by the Abitibi Power and Paper Company, Ltd. This compares with 1939 net of $343,748, or 98 cents each on 100,000 common shares.

Hawley Pulp Nets $1.24

The Hawley Pulp and Paper Company for 1940 reports a net income of $436,406, equal after preferred dividends, to $1.24 each on 200,000 common shares, against $236,431 or 24 cents a common share in previous year; net sales, $4,757,089 against $3,637,916.

Oxford Earns $807,449

The Oxford Paper Company for 1940 reports a net income of $807,449, equal after preference dividends to 77 cents each on 380,735 shares of common stock, against $673,787, or 42 cents a common share, for 1939.

Eaton Nets $47,107

The Eaton Paper Corporation for 1940 reports a net income of $47,107, equal after preferred dividends, to 18 cents a share on 34,643 common shares, against $51,473, or 31 cents a share on 34,093 common shares in 1939.

HIGH TEMPERATURE HAZARD ON JORDAN BEARINGS ELIMINATED WITH SUPERLA GREASE

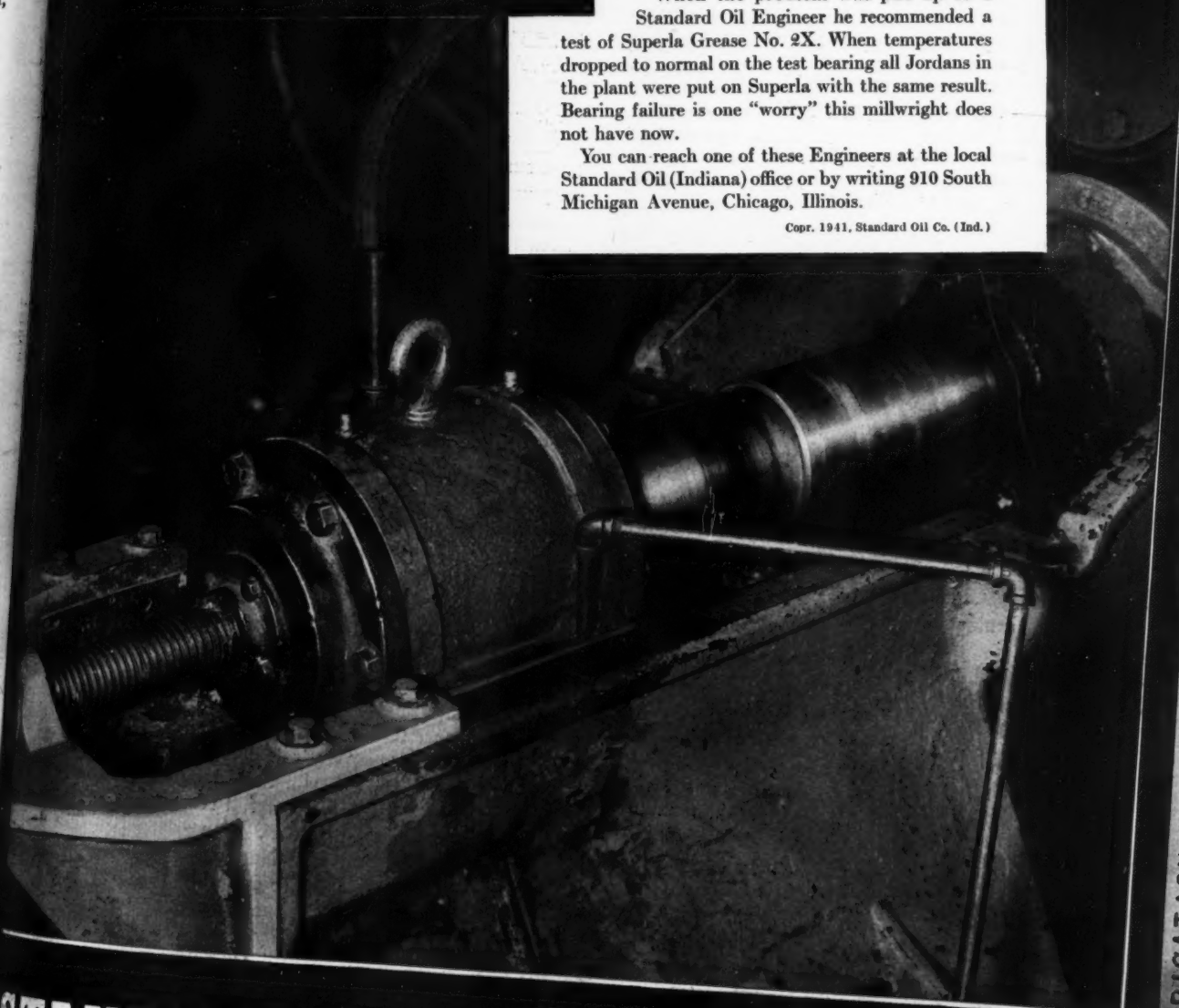
● HIGH TEMPERATURES in Jordan bearings had the millwright in a Michigan paper mill worried. These bearings cost about $360 per set not including lost machine time and labor costs in replacing them.

An ordinary type of pressure-gun grease was being used. But this was clearly not a good time to consider lubricant costs. One bearing failure would cost more than all the lubricant these bearings would use for some time to come.

When the problem was put up to a Standard Oil Engineer he recommended a test of Superla Grease No. 2X. When temperatures dropped to normal on the test bearing all Jordans in the plant were put on Superla with the same result. Bearing failure is one "worry" this millwright does not have now.

You can reach one of these Engineers at the local Standard Oil (Indiana) office or by writing 910 South Michigan Avenue, Chicago, Illinois.

Copr. 1941, Standard Oil Co. (Ind.)



STANDARD OIL COMPANY (INDIANA)

LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRI

PAPER
TRADE JOURNAL
This Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 112 March 6, 1941 No. 10

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Twenty-second Annual Convention, Poland Spring House, Poland Spring, Me., June 17-19.

NO ECONOMIC BOOM

As the national defense program progresses at an accelerated rate the magnitude of the Plans for national security unfold. The transition of the country from a peace-time economy to a military economy is of necessity relatively slow in its earlier months. But already the effect of huge government expenditures has rapidly advanced industrial production. The Federal Reserve index for January rose to 140, the highest on record. Making allowances for the growth of population and the lower price level, the per capita distribution of merchandise is reported to be substantially higher in 1940 than in 1929.

Although the cost of providing adequate national security is generally viewed as a necessity, the cost is high. In an analysis of the subject *The Guaranty Survey* of February 24, published by the Guaranty Trust Company of New York, visualizes the cost of rearmament as follows: "If a printing press had begun turning out dollar bills at the rate of one a second when Columbus first landed in the New World and had continued to produce at the same rate ever since, the amount would still be three billion dollars short of the sum required to pay the estimated expenses of the Government for the next fiscal year. If seventeen billion dollar bills were laid end to end, they would stretch for a distance of 1,643,387 miles, or sixty-six times around the earth at the equator. The amount is literally astronomical, for the same dollar bills would form six strands extending from the earth to the moon, with more than two billion dollars to spare. Seventeen million popular-priced automobiles costing a thousand dollars each could be purchased with the same amount, one car to every eight persons, or every two families, in the United States."

In computing the cost per capita, *The Survey*, goes on to say that, "Seventeen billion dollars means an average of $129.11 for every man, woman and child in the United States, or more than $500 for each family of four. The 1941 budget figure compares with total appropriations of the Federal Government of $463,383,480 for 1891, $705,653,298 for 1901, $1,039,550,617 for 1911, $4,780,829,510 for 1921, and $5,071,711,694 for 1931. Before 1918, no annual figure had ever passed the two-billion-dollar mark. The annual interest on seventeen-billion dollars at 2½% amounts to $425,000,000, or what it cost to run the entire Government fifty years ago. To earn this interest, the 48,400,000 employed workers of the country, as estimated for December by the National Industrial Conference Board, would have to work nearly two days each year at five dollars a day; and to pay the principal each one would have to work seventy days at the same rate. . . Comparisons like the foregoing, applied to the outlook for Government finances in this country, are not mere statistical curiosities. Their implications have a vital meaning for every American citizen. They are not made here for the purpose of criticizing defense expenditures; for it is all but universally conceded that rearmament is essential, and modern armaments inevitably cost huge sums of money. But there appears to be a tendency in many quarters to regard the defense program as not only a military necessity but an economic boom as well, as if a valid excuse had finally been found for the temporarily easy habit of governmental borrowing and spending that the people of the United States have formed in recent years."

Continuing, the analysis says in part: "Such a fundamentally false view of the situation is likely to lead to loose fiscal policies at a time when the exact opposite is urgently required in order to do the imperative job of rearmament in the most efficient and economical way. Rearmament may, for a time, stimulate employment and increase the national income; but in the end it must represent not a source of wealth but an enormous economic burden to the American people. If this necessary burden is to be prevented from having permanently harmful results, it must be carefully and equitably distributed and must be held to a minimum by the exercise of the most rigid economy in non-essential expenditures. And it must be recognized and shouldered now, not at some indefinite future time."

Pointing out that America's defense effort requires a middle course which will unite labor, agriculture, business and government in a full recognition of domestic and foreign problems, Henry H. Heimann, executive manager of the National Association of Credit Men, declared in his Monthly Business Review of last week that "Business is seeking the development of an attitude whereby it is apt to be 'damned if it does and damned if it doesn't'." Already there are attempts to maneuver business into the center of

a controversy on plant expansion for defense purpose," he said. "Many of the proponents of such an increase in facilities were in the group that in the past two decades unfairly branded many business men as 'merchants of death' because, when the previous call to arms were sounded, they expanded to meet the needs. . . Certain basic deductions, which should be guide posts for our national policies in these troublesome days can be made at this time," Mr. Heimann said.

In amplifying these guiding principles, Mr. Heimann said that, "The first is that business should agree, and probably does agree, that in its own best interests, as well as that of the nation, there must be no profiteering. Second, labor should also agree upon a policy of non-profiteering. Third, agriculture should by all means recognize the injudiciousness of price rises such as characterized the first world conflict. Fourth, government should recognize that a truce is needed with respect to witch-hunting prosecutions, to further intensive regulation. While business, labor, and agriculture agree as to the wisdom of restraining prices rises, government must in fairness confess that the cost it assesses contributes to rising prices."

Knowlton Bros. Changes

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., March 3, 1941—Announcement is made here of a number of changes in personnel at Knowlton Brothers, Inc., with the resignations of Franklyn E. Davenport as vice president and general manager, and R. C. McQuiston as director of research. Both resignations become effective April 1. It was stated that Messrs. Davenport and McQuiston plan to organize a new concern with main offices in New York City. The efforts of the new company will be devoted to the servicing of paper mills manufacturing special papers. The name of the company has not yet been selected. Mr. Davenport came to this city several years ago from Manchester, Conn., where he was with the Rogers Paper Company as a salesman. In 1937 he was named general manager and in 1938 he became vice president in charge of manufacture and sales. He plans to move his family to Scarsdale. Mr. McQuiston is president of the Tanide Products Company, of Watertown, Mass., and has been connected with the firm of Knowlton Brothers for a few years in a consulting capacity.

New York To Plant 5,000,000 Trees

ALBANY, N. Y., March 3, 1941—A total of more than five million young trees will be used in spring planting according to orders already placed by customers with the State Conservation Department. The orders are chiefly for pine and spruce and delivery will start in the middle of April. Trees are set aside first for private individuals and firms and then are alloted to municipalities which have ordered about a million. Millions of acres in the state remain to be reforested. In 1917 there were only 751 orders for a total of 7,000,000 trees while in 1940 the orders amounted to 5,132 for 28,500,000 trees. The shipments last year were enough to cover 28,500 acres.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1941		Corresponding Weeks, 1940	
January 18	85.6	January 20	90.1
January 25	86.8	January 27	91.2
February 1	85.8	February 3	89.2
February 8	86.8	February 10	87.9
February 15	88.9	February 17	86.6
February 22....(Prelim.)	89.6	February 24	86.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1940	90.2	86.2	83.9	86.3	91.8	93.8	87.1
1941	84.8	...	...	...	...	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1940	87.2	83.2	88.0	86.9	83.3	87.5
1941	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941
Year to Date...	67.3	76.9	90.2	66.3	79.6	89.1	86.5
Year Average...	70.5	81.3	80.6	72.3	84.9	87.5	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	62	67	67	70	69	70	69	75	78	82	80	74	72
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	72	74	72	79	77	71	73
1941	75	..	..	..	..	..	..	..	..	..	..	..	..

Week ending Jan. 18, 1941—78
Week ending Jan. 25, 1941—78
Week ending Feb. 1, 1941—79
Week ending Feb. 8, 1941—79
Week ending Feb. 15, 1941—81
Week ending Feb. 22, 1941—80

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Waste Dealers To Hold Large Banquet

That the attendance at the twenty-eighth annual banquet of the National Association of Waste Material Dealers, Inc., to be held on the evening of March 19 which is the closing day of the association's 3-day convention at the Hotel Sherman, Chicago, is to be larger than at any previous function of the kind held by the association is evidenced by the fact that the first ten reservations were for 180 tickets, an average of 18 for each concern.

With such a large response weeks before the convention opens, the committee has every reason to believe that the attendance at the annual banquet as well as at the convention itself is going to far out-distance anything witnessed heretofore. According to reports from Chicago the speaker at the annual banquet of the association will be a man of national importance, one sure to bring to the members and their guests an address well worth hearing. Banquet reservations as long as seats remain may be had by addressing the association's executive Offices, Times Building, New York, or the chairman of the banquet committee, George Birkenstein, 332 South Michigan Boulevard, Chicago.

Maj. Eliot To Speak at Boston Dinner

BOSTON, Mass., March 3, 1941—Major George Fielding Eliot, radio news commentator, is to be the speaker at the Fifty-fifth Anniversary Banquet of the Boston Paper Trade Association, to be held Wednesday evening, March 19, at the Algonquin Club. His subject is "The International Situation as of Today." Three applications for membership are to be voted on. The reception is at six o'clock, with dinner scheduled for six-thirty.

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SHAFT SLEEVES — Screwed on shaft abutting impeller to make a water-tight joint; can expand freely with temperature.

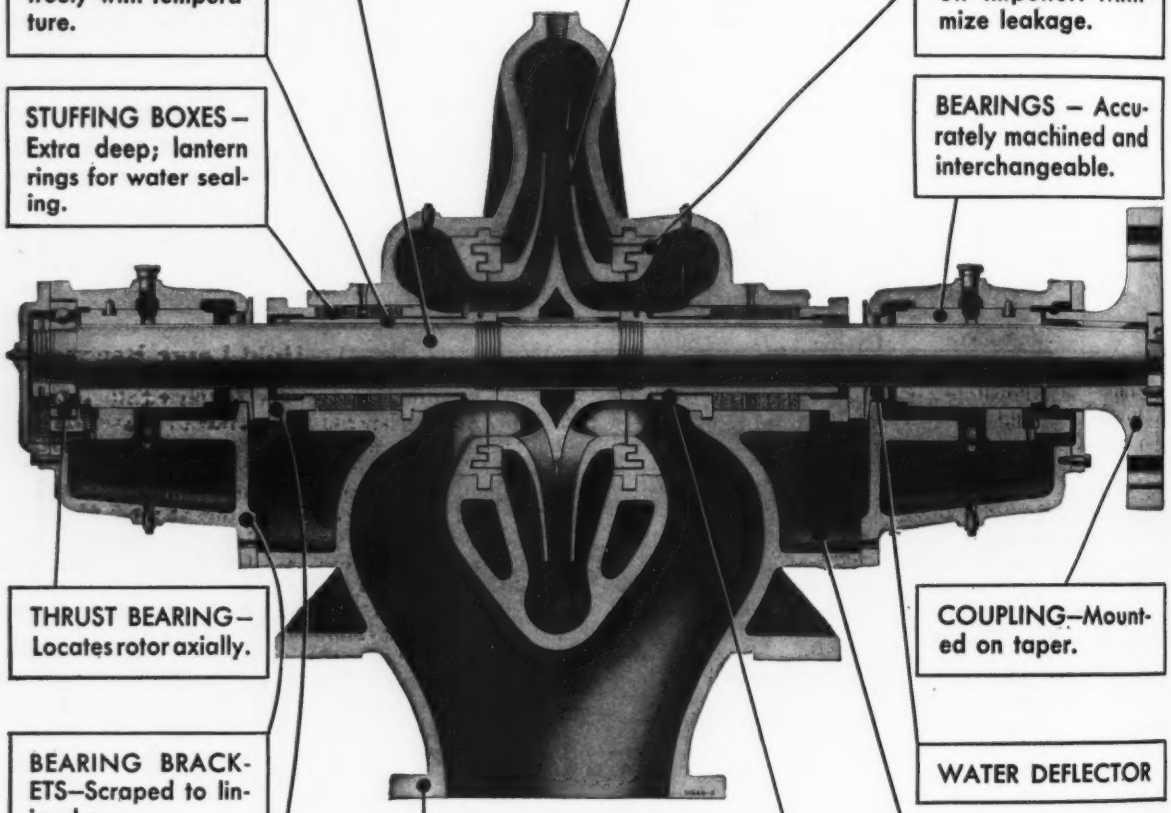
SHAFT — Hammer-forged steel, ground to limit gages.

BRONZE DOUBLE SUCTION IMPELLER —Finished on all surfaces.

LABYRINTH WEARING RINGS — Bronze, held in machined grooves in case and threaded on impeller. Minimize leakage.

STUFFING BOXES — Extra deep; lantern rings for water sealing.

BEARINGS — Accurately machined and interchangeable.



THRUST BEARING — Locates rotor axially.

COUPLING—Mounted on taper.

BEARING BRACKETS—Scraped to lining bars.

WATER DEFLECTOR

BRONZE GLANDS — Split horizontally.

PUMP CASE—Horizontally split, machined to limit gages.

PROTECTING BUSHING — Removable.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Control of Paper Expansion in Multicolor Lithography*

By Charles G. Weber[1]

Abstract

Air conditioning is of great importance in the printing industry in general because atmospheric variations and extremes of temperature or humidity result in troublesome operating problems. Paper is sensitive to the atmospheric variations and conditions, and symptoms of disturbing atmospheric effects are: static electricity; distorted, curling, or buckling papers; wavy edges; and misregister of color prints in multicolor printing. Studies of the factors which affect the register of prints in multicolor offset printing have been in progress at the National Bureau of Standards for several years. It has been previously shown that the stabilization of the moisture content during multicolor printing is essential, and that stabilization can be accomplished by special adjustment of the moisture content before printing the first color. This article describes a new method of obtaining the correct adjustment of the hygrometric condition of the paper.

For best results, the paper must contain an excess of moisture before the start of the first printing. The correct excess of moisture amounts to from 0.5 to 0.7% above equilibrium with the air in the pressroom. It is obtained by conditioning the paper to moisture equilibrium with an atmosphere having a relative humidity 5 to 8% above that in the pressroom. In the method just developed, adjustment of the moisture content is quickly and conveniently accomplished with the conventional type of paper-conditioning machine by adding water, in measured amounts, to the air within the machine. The method employs humidifier spray nozzles which are fed from a reservoir into which the water is measured. The method makes it possible to bring paper to a selected moisture content not below equilibrium with the room air, and greatly increases the rate of conditioning.

For several years, the factors which affect the register of successive color images in multicolor offset printing have been under study at the National Bureau of Standards. The failure of paper to remain constant with respect to length and width during the printing process was found to contribute most to the difficulty of obtaining accurate register; hence, the causes of changing dimensions have been studied and methods of control investigated. The progress that has been made has given a much better understanding of the behavior of paper than heretofore. Also control of dimensions is now entirely practicable and is being accomplished in commercial scale operation by stabilization of the hygroscopic condition of the paper.

The research on offset papers is carried on in the paper section of the Bureau with the cooperation of the Lithographic Technical Foundation, and with the assistance of a fund deposited with the Foundation by a group of manufacturers of offset papers. Also, the work has benefited from the cooperation of the Printing Division of the U. S. Coast and Geodetic Survey, where experimental printings are made under controlled atmospheric conditions. The studies are planned with the counsel of an advisory committee of technical representatives of the sponsors under the chairmanship of Professor R. F. Reed, Director of Lithographic Research, University of Cincinnati.

Stabilization of Moisture Content

In multicolor lithography, the effects of expansion of the paper are probably more serious than in any other printing process. The dimensions of the paper must remain constant during a complete printing, which may comprise from 3 to 20 or even more trips through the press, and may require a week or longer for completion. Expansion of paper will have serious effects on register; and since there is a straight-line relationship between moisture content and dimensions, the necessity of stabilizing the moisture content is apparent.

Normally, paper that has been conditioned to adjust its moisture content to equilibrium with the atmosphere will remain unchanged in dimensions as long as the relative humidity and temperature are kept constant. Unfortunately, that is not the case in offset printing. In that process, water is used on the plate, and absorption of water from that source will result in expansion, even under the best conditions of atmospheric control, unless the paper is given special conditioning before printing the first color.

It has been found possible to adjust the hygrometric condition of the paper, so that it will lose

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

[1] Member TAPPI, Assistant Chief of Paper Section, U. S. National Bureau of Standards, Washington, D. C.

moisture to the atmosphere during printing at the same rate that it absorbs moisture from the press, thus preserving a balance. This will occur in a conditioned pressroom if a small excess of moisture, to bring the moisture content above equilibrum with the surrounding air, is added to the paper in its preparation for the first color printing. When printing with a normal amount of water on the plate, the excess moisture required has been found to be 0.5% or slightly more *(1)*. When it is not provided by accurate adjustment of the moisture by the manufacturer, the excess can be introduced by conditioning the paper to equilibrum with an atmosphere having a relative humidity 5 to 8% above that maintained in the pressroom. The machines for conditioning paper that are in common use in printing plants are designed to bring paper to equilibrium with the atmosphere of the room in which they are operated. Hence, it has heretofore been necessary to condition the paper in a room separate from the pressroom, and under independent humidity control, for satisfactory results.

Recently, improved practice for conditioning the paper (to the correct hygrometric state to insure satisfactory moisture stabilization during multicolor printing) was developed by the Bureau. The method facilitates the conditioning of paper to the desired moisture content, and makes possible a greatly increased rate of conditioning. The results can be achieved with the conventional type of conditioning machine with some modifications, and a separate room with independent humidity control, while desirable, is not essential.

New Method of Conditioning Papers

The new method of conditioning to give the paper the optimum moisture content consists essentially in adding water in measured amounts to the paper while it is being conditioned. It is done by mixing the moisture, in finely-divided form, with the air to which the paper is exposed in a conditioning machine. It is applicable to any type of machine that operates on the principle of blowing air over the paper, arranged in hangers for maximum exposure. The moisture is added by means of atomizer nozzles which spray it into the air entering the blower. By this method it is entirely feasible to bring paper to the desired condition by first determining the moisture deficiency with the sword type of paper hygroscope, *(2, 3)* then adding through the sprays, the amount of water necessary to make up the deficiency.

The moisture deficiency of a paper can be quickly and conveniently computed from the sword hygrometer reading. The article by Reed *(3)* on the use of the paper hygroscope contains on page 9 a table which shows the deviation of moisture content for each deflection of the pointer. Thus, if the reading indicates that the moisture content is low by 0.5%, one half pound of water per 100 pounds of paper must be added to bring the paper to equilibrium with the surrounding air. Of course, that will be satisfactory only if the humidity of the air is 5 to 8% above that of the pressroom. If the conditioning machine is operated in the pressroom or under the same conditions as prevail there, then an additional 0.5 to 0.7% of moisture must be added, bringing the total amount to be added up to about 1.1 pounds per 100 pounds of paper.

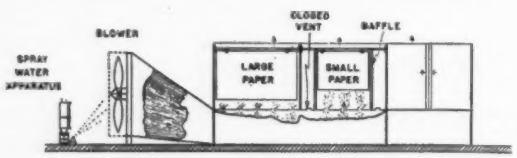


FIG. 1

Machine for Conditioning Offset Papers, Showing Moistening Device and the Proper Position of Baffles and Vents for Relatively Small Sheets of Paper.

After the required amount of water has been computed, the paper is placed in the machine, and one half the water is added to the air stream entering the circulating fan. The paper should then be reversed end for end in the hangers and the remainder of the water added.

The operation of the method is shown by the following account of the conditioning treatment applied to the paper in preparation for the printing of a 15-color map in regular production at the Coast and Geodetic Survey.

The paper, consisting of 6000 sheets of hard, glue surface-sized chart paper 36 by 44 inches in size and weighing 2400 pounds, was tested with the sword hygrometer. The sword readings indicated a moisture deficiency of approximately 1%, or 24 pounds of water. Hence, it was necessary to add that amount to the paper to bring it to equilibrium with the surrounding atmosphere in the paper room, where the relative humidity was 8% above that in the pressroom. The paper was placed in the hangers of the conditioning machine in lifts of 40 sheets each. The conditioner was put in operation and 12 pounds of water was added at the rate of 20 pounds per hour, through the spray heads to the air entering the fan. The paper was then reversed in the hangers and an additional 12 pounds of water was added at the same rate, making a total of 24 pounds of added water. The paper was then removed from the machine and piled. A sword hygrometer reading at this time indicated that the paper was slightly moist relative to the surrounding air. However, after the paper had been allowed to stand in the pile overnight, it was found to be in hygrometric equilibrium with the air in the room. The change during seasoning in the pile doubtless resulted from a better distribution of the moisture. Figure 1 shows the method of adding moisture to the paper in a conventional type of conditioning machine. Details with respect to the construction and operation of the spray apparatus are given in a technical bulletin of the Foundation *(4)*.

The results obtained by this method of conditioning will depend largely on the efficiency of the machine and its operation. It is important that spaces between the ends of the sheets of paper in the racks and the ends of the paper compartments be closed by the use of baffles to prevent escape of the air around the ends of the paper. All air vents not directly under the paper should be kept closed. These points are shown in Fig. 1.

It is important to remember, particularly when this method is first tried, that conditioning machines may differ widely in efficiency. It may therefore be found necessary to add more water than the amount of the computed deficiency. However, since all paper should be carefully checked with the sword after conditioning, it will be a simple matter to determine for each machine, the actual amount of water that must be added to overcome the computed deficiency. When the paper has been conditioned, the sword reading showing its hygrometric state relative to the

pressroom atmosphere should be as shown in Fig. 2.

This method of conditioning has been successful in commercial operation at the Coast and Geodetic Survey for more than a year. It has resulted in better conditioning than was heretofore possible and the capacity of the conditioning machine was more than doubled by increasing the rate of conditioning.

In plants where the conditioning of paper must be done in the pressroom or at best under the same atmospheric conditions that prevail in the pressroom, special precautions must be taken. If a separate room with higher relative humidity cannot be made available, the machine can be inclosed and operated as a closed system recirculating the air. With this arrangement, the same procedure is followed as in the separate room except sufficient water is added to raise the moisture content of the paper 0.5% or slightly more above equilibrium with the room air.

Conclusions

The benefits of air conditioning in multicolor offset lithography will not be fully realized even with the best humidity and temperature control obtainable unless the paper is given special conditioning treatment.

For solution of the register problem, as far as the paper is a factor, the paper must be treated to provide an excess of moisture above equilibrium with the pressroom air. The excess should be 0.5 to 0.7% moisture content, as indicated by a sword hygrometer reading.

The optimum condition can be rapidly and conveniently obtained by the new method in the conventional type of conditioning machine with some modification. It is done by adding water in measured amounts to the air entering the circulating fan of the conditioner in which the paper is exposed for conditioning. The water is added in finely divided form by means of atomizer spray nozzles.

The use of the new method has increased greatly the rate of conditioning in a commercial conditioner of conventional type and has produced uniformly better results than heretofore obtained.

FIG. 2

Sword-Hygrometer Dial Showing a Reading Which Indicates the Paper Is in the Correct Moisture Condition, Relative to the Pressroom Air, for Multicolor Lithography.

Literature Cited

(1) Weber, C. G., and Geib, M. N. "Treatment of offset papers for optimum register." *J. Research Natl. Bur. Standards* 16, no. 2:93-103 (Feb., 1936); Research Paper 859; *Paper Trade J.* 103, no. 12:36-40 (Sept. 17, 1936); *TAPPI Sect.* 103:381.
(2) Reed. "The paper hygroscope." Sales Bull. no. 1, Research Series no. 6, Litho. Tech. Foundation. 1931.
(3) Reed. "Modern paper-conditioning methods and the paper hygroscope." Tech. Bull. no. 1, Research Series no. 9, Litho. Tech. Foundation. 1937.
(4) "Method of conditioning paper for multicolor offset printing." Tech. Bull. no. 3, Research Series no. 9, Litho. Tech. Foundation. 1940.

TAPPI Notes

The fall meeting of the Technical Association of the Pulp and Paper Industry will be held at Ann Arbor, Mich., September 16-19, 1941. Headquarters will be at the University of Michigan.

Andrew W. Foley, formerly of the American Cyanamid and Chemical Corporation is now general superintendent of the Carolina Fibre Company, Hartsville, N. C.

J. W. Merrill, formerly of the Crocker-McElwain Company is now chemist for the Whiting Paper Company, Holyoke, Mass.

W. E. Lambert, formerly chemist for the Kimberly-Clark Corporation is now in the research department of the Oxford Paper Company, Rumford, Maine.

Paul Torre, formerly with the A. E. Staley Manufacturing Company is now with the DeZurik Shower Company, Sartell, Minn.

John A. Feola, Jr., recently graduated from the New York State College of Forestry is now a chemist with the St. Regis Paper Company, Deferiet, N. Y.

Julien Boesinger, recently of the John A. Manning Paper Company is now with the 22nd Sta. Hospital, Camp Hulen, Texas.

Harry Rowley, formerly technical director of the Anglo-Canadian Pulp and Paper Company is now with the Explosives and Chemicals Div. of the Allies War Supplies Corporation, Montreal, P. Q.

The Research Development Division is planning to organize a new committee dealing with fundamental chemical and mechanical engineering research subjects. Any member of the Technical Association, particularly engineering school graduates of the past ten years who would be interested to serve on such a committee should write to R. G. Macdonald, secretary of TAPPI, 122 East 42nd street, New York, N. Y.

Frederic T. Burkhardt Resigns

P. E. Hodgson, president of the Keith Paper Company, Turners Falls, Mass., announces the resignation of Frederic T. Burkhardt vice president, in charge of sales, effective March 1, 1941. Carl Werner, who has been associated with Mr. Burkhardt in the sales organization, will be in charge of the sales office located at the mill in Turners Falls.

Use of Urea Formaldehyde Resins for Wet Strength Paper Production*

By Philip B. Taft[1]

Abstract

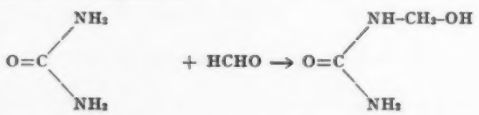
The chemistry of the aqueous type of urea formaldehyde resins and their application in fields closely related to the production of high wet strength paper is discussed. Particular emphasis is laid on the condition of temperature, pH, concentration and modification in the size and in the sheet during drying, showing their effect, with time, on size stability, speed, and extent of wet strength development. The characteristics of a sheet treated with such a resin, are discussed and a logical theory for the mechanics of the reaction given.

In a paper presented at the 1940 Annual Meeting of the Technical Association of the Pulp and Paper Industry Myers *(1)* reviewed the possibilities for utilization of synthetic resins in the paper industry. Snythetic resins have been a little out of reach for the average paper manufacturer from the cost standpoint and have been confined more to specialties where the cost could be borne. With continued work on both the part of the paper technicians and the synthetic resin producer, particularly toward more effective application of resins in paper, use of such materials will undoubtedly fulfill certain requirements and demands.

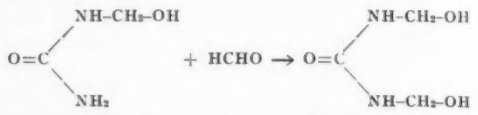
Urea Formaldehyde Resins

The two constituents, urea and formaldehyde, are synthesized from 4 gases. Urea is made from carbon dioxide and ammonia under the proper heat and pressure. It is white, water-soluble, and the amide of carbamic acid. It contains 2 reactive amino groups. Formaldehyde, the other starting material, is produced by high temperature catalytic oxidation of methyl alcohol, which itself is made from carbon monoxide and hydrogen, the other 2 gases. Formaldehyde, simplest of the aldehydes, is sold as the 40% solution, formalin, or as the solid polymer, paraformaldehyde.

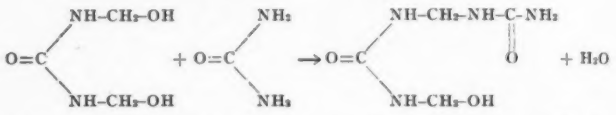
In the preparation of a urea formaldehyde resin, the two components are mixed in the proper ratio and subjected to the necessary reaction conditions of temperature, pH, concentration, and pressure. The first reaction to occur is an addition reaction in which the formaldehyde adds to one of the amino groups of the urea to produce monomethylol urea, as shown in Equation 1:



The remaining amino group can react similarly to produce the dimethylol derivative as shown in Equation 2:



The molecule now contains two hydroxyl groups and further reaction becomes more complex, for there is a possibility of internal condensation to produce the nonreactive methylene urea, or it may react with the amino group from another molecule or it can react with more urea. Condensation may proceed as shown in Equation 3:



From this point on, the reaction becomes exceedingly complex for long chains can be built up in the manner shown or cross linkages can be established with such structures reacting at the secondary amino group in the compound shown in Equation 3. As the molecular weight of the compound increases, the viscosity of the solution increases and water solubility decreases. As a matter of fact, viscosity determinations are used as a means of following the reaction.

We will consider only the aqueous types of urea resins. Under the proper conditions this type of resin can be condensed with the proper modifiers to produce organic solvent soluble resins which find application in protective coatings, particularly in the baking type of finish used on refrigerators and hospital equipment. This type of resin is out of the scope of our present subject, and we mention it only to be certain that you are thinking in terms of water-soluble, urea formaldehyde resins.

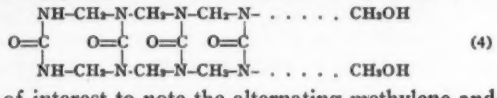
In the production of the resin, the reaction is not allowed to proceed far beyond the water-soluble stage. Strictly, the resin should really be termed as an intermediate. As such it is either dried or sold as a solution. Its reactive character is utilized by the plywood producer, the textile finisher, or the paper manufacturer. Since it is a reactive material, some care must be exercised in storage. Storage under elevated temperature conditions promotes the reaction reducing water-solubility and increasing viscosity.

The resin reaction which must be completed during the application to the paper sheet is controlled by the same conditions used in manufacture, namely: pH, heat, and concentration. Additional factors due to the presence of plasticizers, catalysts, or modifiers, cause these final reactions to be of an extremely complex nature. The final unmodified cured product can be described as a hard, colorless, odorless, and

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

[1] Member TAPPI, Resinous Products and Chemical Co., Inc., 222 W. Washington Sq., Philadelphia, Pa.

tasteless resin. It is considered water-resistant though it is not impervious to attack by water. Its structure, simply represented, is shown in Equation 4:



(4)

It is of interest to note the alternating methylene and nitrogen groups in this structure, not too different from the structure of a protein molecule.

Application of Resin in Paper

Use of urea formaldehyde resins in the paper mill is rather different from other applications. First, let us consider the matter of curing the resin. Curing is merely a generic term which the chemist uses to describe that process in which thermosetting resins are transformed to their inert, infusible, insoluble state. Resins must be cured sufficiently so as to form products which are stable and durable. This is accomplished in principle by utilization of the same factors of concentration, pH, temperature, and time, used in making the resin. Generally the more exaggerated treatment will produce the faster cure—i.e., the lower the pH, the higher the concentration, and the higher the temperature, the faster goes the resin to the final stage. Curing may be accomplished at room temperature provided a catalyst is used which produces a low pH and the time factor is extended. A complete cure may be obtained by maintaining a moderate pH, provided elevated temperatures are used over a relatively long period. A neutral urea formaldehyde resin, at room temperature, will eventually cure by itself, if given sufficient time. This reactive characteristic, typical of all urea formaldehyde resins, is undesirable from the standpoint of storage but is most desirable in view of their application in subsequent processing.

Papermaking procedure usually limits these curing conditions. Drying temperatures, above which paper is affected deleteriously, cannot be employed. A catalyst must be used in order to obtain the necessary pH but which will not leave residual acidity and thereby impair the permanence of the sheet. Sufficiently low resin concentrations must be employed in the size so that a stable size can be maintained on the one hand and one which will not give too high viscosity or excessive pickup on the other. Normal paper machine speeds must be maintained. This means a resin cure in a matter of seconds rather than a matter of minutes as in most applications.

The most desirable point in the papermaking processes to apply a urea formaldehyde resin would be at the beater. This would allow the benefit of the heat treatment of the entire drier section and would mean no added equipment installation. Unfortunately, no resin available is capable of effective use in the beater. Owing to the solubility of the resin, the retention is low. Use of the size tub, spray, saturator, or some other system whereby 100% or close to 100% size retention is to be had, up to this time, has given more satisfactory results.

Use for Wet Strength

Wet strength is dependent not only upon the concentration of resin in the sheet but the state of its cure as well. In short, the more complete the cure, the less resin is necessary and the production cost is lower. For any given machine the point of application is predetermined and unless machine speeds be varied, the time of the sheet at elevated temperatures is likewise predetermined.

Temperature has a marked effect on cure. Speed of cure varies directly with temperature. Actually, resin cure starts as soon as the wet sheet is warm even though water still be present. Curing speed reaches a maximum when the sheet reaches a maximum temperature. The temperature at which the sheet is reeled is sometimes important too, for in this way, the sheet may be held for a number of minutes at a moderate temperature which will cure the resin at a moderate speed. Curing at unusually high temperatures at high speeds as well as curing with infrared have been suggested.

The concentration of the resin solution going on the sheet is important. We do not refer here to the concentration of the resin in the sheet for this has little effect on speed or extent of cure, although it will make a real difference in the wet strength developed. We refer here to the concentration of resin in the size solution. The use of as concentrated a size as possible, yet one which is safe from the dangers of precipitation or gelation, is recommended. The less water that is put into the sheet, the sooner the sheet approaches the temperature of the drier surface and the faster the cure.

Catalysts

Of the four factors influencing cure, pH is possibly the most important. The catalysts produce the necessary low pH and the increased rate of resin cure. Certain catalysts appear to be capable of exerting a stronger influence on resin cure than merely through the pH that they produce.

Two types of these catalysts differ in their action but actually produce the same ultimate effects. Ammonium salts of strong acids, for example, ammonium chloride, represent one class. Aluminum salts, aluminum sulphate, for example, represent the other class. The principle involved in the use of the ammonium salts depends upon the reaction between the urea formaldehyde resin and the salt which results in the gradual formation of acidity. This reaction may be followed by adding an ammonium salt to a urea formaldehyde resin solution and checking the pH at various subsequent time intervals. The pH will fall lower and lower if too much salt is present and may even go as low as 1.5 to 1.7. The most desirable pH in such a size is in the range of 3 to 4. At a pH above this range, the catalytic action is slower, lower than this range it is too active and apt to precipitate or gel the size or otherwise reduce its wet strength producing potentialities. Proper adjustment of catalyst is necessary to prohibit too rapid a decrease in pH. Another means of prohibiting too rapid a decrease in pH in certain cases is to adjust the system with ammonia.

Aluminum salts are suitable catalysts. They can be added in concentrations such that will create a drop in pH to the desirable range without danger of further decrease and subsequent decreased size stability. By the use of aluminum sulphate, a pH in the desired range can be obtained immediately, rather than after a time interval as in the case of the ammonium salt, and this too is a significant point. The extent of cure resulting in a resin cured with an aluminum salt is about that which can be obtained from the same resin cured with the corresponding free acid. Even more important than the extent of

resin cure, when utilizing the aluminum salt, is the rate of cure with this catalyst. The difference between rate of cure obtained with the aluminum salts as compared with the ammonium salts is marked.

Catalyst concentration defines degree of cure to some extent. In the case of either type of catalyst, however, there is no increased effect from the use of catalyst in concentrations higher than 10 to 12% on the weight of the resin solids. Of the two types of catalyst, the aluminum salts are the more desirable for they produce a size which is immediately ready to produce maximum wet strength, do not allow further pH decreases at high concentrations, and have a more powerful catalytic effect. In some cases, however, presence of aluminum ions in the sheet decreases transparency or absorbency in which case the ammonium salt is preferred as the catalyst.

The question is often raised regarding the effect of these catalysts on the permanence of paper. Actually the residual acidity due to presence of catalyst in the tub size is much less than would be supposed. At high concentrations of resin and catalyst we have never been able to produce a sheet with a pH below 4.6. Such sheets were sized with abnormal concentrations of resin and catalyst and a normally prepared sheet would, of course, exhibit a somewhat higher pH. In many cases, the presence of the alum in the sheet which is supplied at the beater is sufficient to cure the resin. This indicates roughly the amount of catalyst necessary to accomplish the desired results.

Effects of the Catalysts

In size preparation, consideration of these same four factors influencing cure must again be considered. Since increasing concentration, temperature, and time, and decreasing pH tend to accelerate the cure, by the same token they decrease size stability. Instability of the size is evidenced by precipitation or in some cases, gelation. Concentrations no higher than 10% resin solids, temperatures no higher than 130 deg. F., and catalyst addition to give a pH no lower than 3, are recommended for good size stability. More drastic conditions may be imposed if it is not necessary to have a size stability as long as 15 to 20 hours. This is shown by the data in Table I. This work was carried out to determine size stability under normal conditions. Wet strength determinations were considered as indicative of the condition of the size. Size concentration and storage temperature were held as shown; catalyst concentration and time being the only two variables introduced. These data were obtained in the laboratory using a waterleaf, soda-pulp sheet with a wet tensile of approximately 60 grams per 0.5 inch test strip, tested in the machine direction of the sheet. The resin size solution was made by diluting a commercially prepared, fairly highly condensed urea formaldehyde solution supplied at 50% solids, to a resin solids concentration of 5%. Small sheets of the waterleaf paper were dipped in the prepared size, couched, dried for 20 seconds on a felted steam drier, operating at a temperature of 105 deg. C. These sheets contain approximately 2.5% resin. Catalyst concentration on the weight of the resin solids is also shown.

TABLE I.—STABILITY OF A UREA FORMALDEHYDE RESIN * SIZE HELD AT 120 DEG. F.
(As Measured by Wet Tensile Determinations)

Size solids—5.0% Drying time —20 min.
Dry pickup—2.5% Original wet tensile—60 g.

Catalyst	Concentration %	Storage Time (hours) 2	6	15	24	30	40
Aluminum chloride	2	1153	1047	896	780	753	712
	4	1350	1338	1152	1143	1111	1037
	6	1490	1403	1390	1347	1112	1095
	8	1680	1473	1198	1161	1123	1103
	11	1618	1484	1256	1235	1217	1098
	15	1815	1715	1198	1124	1100	1012
Ammonium sulphate	2	414	426	992	854	847	811
	4	444	521	954	864	816	649
	6	491	546	1063	971	955	937
	8	581	562	1112	1095	957	948
	11	611	758	1216	1125	910	876
	15	759	785	1218	970	937	902

* The data is based on results obtained with Uformite 449. Any other urea formaldehyde condensate would produce different values.

No values are shown at 0% catalyst concentration. Such values, however, would be little higher than the 60 grams wet tensile strength of the untreated base stock and hence were omitted.

All of these sizes, even those containing the excessive amount of 15% catalyst, had not gelled and were still capable of producing excellent wet strength after 40 hours storage at 120 deg. F.

At the level of any aluminum chloride catalyst concentration, as we extend the time before sizing, the wet strength producing potentiality of the size becomes increasingly poorer. Thus time is an important factor in size stability, especially after the catalyst has been added. pH was the second factor studied in this work. The pH at the level of 15% catalyst is, of course, lower than the pH at the 4% level; and as a result, a higher wet tensile determination appears at this level because we have obtained a more complete resin cure. However, this also has its effect on size stability. After two hours storage, a wet tensile determination of 1350 units at the level of 4% catalyst and 1680 units at 8% catalyst concentration was obtained. After 28 hours storage, at the 30-hour column, the 4% catalyst level produces 1111 units compared to an original of 1350; but the size with 8% catalyst produces only 1123 units compared to an original of 1680, a much more marked reduction at the lower pH.

The same is essentially true of those results obtained when using the ammonium salts as catalysts. The aluminum salts are more effective however, and only after 15 hours storage do the results using the ammonium salts as catalysts compare very favorably with them. This is caused by the gradual decrease of the pH down through the optimum range of 3-4. In the first half of this table—i.e., for values in all columns up through 15 hours storage—results are not strictly comparable to the data immediately above. Beyond this point, the low pH and the increase in storage time produce decreased size stability in the same manner regardless of the type of catalyst chosen.

Only two factors were varied in this study. Of the other two factors of concentration and temperature, it should be stated that increasing either of them would tend to reduce size stability and would be evidenced by even lower values at the righthand side of the table. At abnormally high concentrations, size gelation might logically occur.

Effect of Drying Time

In the preceding data, the effect of two conditions on size stability was discussed. The data in Table II appears as wet tensile determinations as in Table I.

The same resin, paper, procedure, and equipment were used in this further experimental work. In this case, however, sheets were dried at a temperature of 105 deg. C. for various periods of time as shown. Again two different catalysts were used, one of them again being aluminum chloride while the other in this case was diammonium phosphate.

TABLE II.—EFFECT OF DRYING TIME ON UREA FORMALDEHYDE RESIN * CURE

(As Measured by Wet Tensile Determinations)

Size solids—5.0% Catalyst	Concentration	Dry pickup—2.5% Original wet tensile—60 g. Drying Time (seconds)					
	%	5	20	40	60	120	300
Aluminum chloride	2	527	557	637	680	827	1006
	4	826	1125	1256	1259	1423	1567
	6	850	870	1418	1539	1635	1646
	8	1097	1340	1463	1477	1565	1587
	11	1325	1405	1421	1507	1536	1625
	15	1306	1470	1510	1540	1542	1609
Diammonium phosphate	2	435	470	492	500	571	766
	4	609	634	656	674	750	820
	6	794	814	827	830	878	1004
	8	805	814	840	855	886	1066
	11	808	887	849	904	942	1238
	15	849	866	887	892	963	1117

* The data is based on results obtained with Uformite 449. Any other urea formaldehyde condensate would produce different values.

Several facts here again are noteworthy. The ammonium acid phosphate produced a lower pH initially than did the ammonium sulphate and hence resembles the aluminum chloride catalyst more closely than it does the ammonium sulphate. Despite this, however, the aluminum salt is still the faster and the more effective for any reasonable period. This is exemplified at normal catalyst concentrations, especially at the 4% level. Note especially that again the resin becomes more completely cured and the higher wet tensiles are obtained, as the drying time is increased. Drying times of less than 5 seconds would show extremely rapid wet strength development, especially at higher catalyst concentration, even more markedly. Such values, as you would expect, are difficult to obtain with accuracy. The increase of catalyst concentration, within limits, decreases pH and increases both rate and extent of resin cure. In these data the reason for use of catalyst concentrations no higher than 10% on the weight of the resin solids is evident. No values are appreciably higher than the 11% level. There are exceptions, just as in other determinations in these same data, but we are interested primarily in trends at this time.

Effect of Plasticizers

We have limited our discussion up to this point, to the fundamentals of application of urea formaldehyde resins. As soon as other materials are added to the size, further complications evolve. Starch, for instance, can be used with a resin solution. While it adds stiffness to the sheet, and in certain cases detracts from size stability, it may be used as an extender for the resin and actually produces an added degree of wet strength. Glycerine, since it is so often used as a plasticizer in certain papers, has been suggested as a plasticizer for this type of wet strength paper. Unfortunately, glycerine very markedly decreases the rate of cure. Naturally, it can be added after the resin has been cured in the sheet but this destroys the wet strength character of the sheet. This destructive effect is quite rapid and in time will practically completely destroy any advantage.

The problem of plasticizing such a paper is not yet really solved. Urea formaldehyde resins are being used commercially on many different types of papers but reduction of stiffness is accomplished by such factors as original sheet softness, minimum of resin and maximum of cure, minimum of surface resin, maintenance of normal moisture content of the sheet, in short, by a combination of factors and not merely by the addition of some unique chemical. Invert sugars have some effect. Certain emulsified products also are of real interest, especially in softer, more open sheets.

An excellent indication of the nature of the wet strength characteristic supplied to a sheet by such a process, is shown in attempts to recover the broke from production. As yet, we know of no good method to defiber such a sheet so that it may be re-used in high-grade papers. Even after beating for 24 hours in a broke beater, such paper shows a marked resistance to disintegration and remains as small bits of paper or fibrous structure. Wet broke and other broke in which the resin is only partially cured can be recovered. Recovery of high wet strength broke is more difficult and is a problem which requires further investigation.

This remarkable resistance to disintegration of the wetted sheet which is the basis of the wet strength feature and which makes for difficult broke recovery, has been thought to be of interest for the production of printing and chart papers where correct register under varying humidities is important. The fact that certain textiles can be stabilized against shrink and stretch has made such a process of even further interest. Studies have been carried out to determine the possible use of urea formaldehyde resins for such a purpose but as yet, we cannot produce a sheet which is sufficiently resistant to dimensional changes, to be of real interest. This particular application requires further study.

Characteristics of Urea Formaldehyde Sized Paper

When work began in this field, it was difficult to make anything which did not possess a harsh, stiff, boardy feel. As the curing rate has been increased and thus allowed the use of decreased amounts of resin, these characteristics have been avoided. Sheets are being made commercially possessing good wet strength which, other than a slight increase in stiffness, correspond very closely to the untreated sheet. In cases where high wet strength papers are produced there may be a decrease in dry tear and in fold. Absorption is impaired very slightly.

A word should also be said about the permanence of the wet strength character of such sheets on storage. We have made quite a study of this point. The results of this study are not sufficiently complete to be regarded as conclusive but a few generalized statements can be made. Loss of wet strength in urea formaldehyde resin sized paper does occur on aging, particularly at high humidities. It occurs to some extent at all ordinary humidities. Wet strength losses on aging seem to occur more rapidly at higher temperatures in the presence of moisture than at lower temperatures. It appears that the rate of decrease in wet strength becomes less with time. These losses may not occur immediately after such paper has been made. In some cases it may slowly increase for even a number of months and might mean a sheet would be converted and in use before the decrease starts.

It should be emphasized that this study was made on individual, exposed sheets, and it would seem safe in assuming that paper, if stored for extended periods, would be in a roll or at least not exposed, in which case we would expect very different results.

Food Packaging

Since wet strength paper often finds a market in food packaging, the question of toxicity in urea formaldehyde resin sized papers is often raised. Whether such papers are toxic or nontoxic cannot be stated unless specific conditions be defined. Actually, if one were to subsist on a diet of such papers, they might logically develop an upset system. This might be due just as much to an excess of roughage as it might be to the presence of a small amount of inert resin. Everyday, people eat vegetables and fruits processed in tin cans lined with phenol formaldehyde resins or drink milk from a molded urea cup. In these cases, the food is in close contact with a high concentration of resin. In the use of urea formaldehyde sized papers for food packaging, the food is in contact with a much lower concentration of resin, perhaps 2 to 3% resin on the weight of the paper. As a matter of fact, evidence available to date indicates that there need be little concern of the toxicity of cured urea formaldehyde resins.

Reasons for Use

Finally, why are urea formaldehyde resins used in this process? Why are they unique and why should we not use some other type? There are a number of reasons. First, they can be made water-soluble or used as water solutions. Their thermosetting character lends their use to established papermaking methods, to produce a colorless odorless, tasteless, water-insoluble, and permanent product. Urea resins, compared to most synthetic resins, are relatively inexpensive. In addition, there is considerable evidence to indicate a chemical combination between cellulose and urea formaldehyde condensates. We know that urea formaldehyde reacts with mono as well as polyhydric alcohols including sugars and starches. All available evidence indicates a comparable reaction with cellulose. The idea of such a reaction is strengthened by virtue of the fact that formaldehyde too combines with starch and cellulose. Another significant point is the relative absorbing power of the various textile fibers for urea formaldehyde condensates. Viscose rayon will absorb much more resin than will a cellulose acetate rayon, quite possibly due to the fact that the hydroxyl groups have already been esterified. It is in terms of this reaction that the mechanics of the wet strength feature are explained. As we understand, the principal reason for the disintegration of a wet sheet is caused by the tendency of the individual fibers to swell, lose their original, unwetted, surface character so that they can then be easily pulled away from one another. Apparently, cellulose fibers which have been treated with urea formaldehyde resins, do not exhibit as marked a tendency to swell and thus produce a paper with high wet strength. The phenomenon could also be explained in terms of a surface coating which would merely waterproof the individual fibers. However, wettability and absorption in a sheet sized with urea formaldehyde resins are practically unchanged. An actual reaction with cellulose seems the best answer to this unique characteristic of urea formaldehyde resins.

Literature Cited

(1) Myers, Frederick J., *Tech. Assoc. Papers* 23:406-409 (June, 1940).

Continuous Coloring of Paper and Paperboard*

By Frederic A. Soderberg[1]

Abstract

The advantages and deficiencies of the various types of dyestuffs when used for continuous coloring are discussed. Tables have been included showing retention factors, solubility, and the effect of certain metals upon dyes.

Next the equipment and assembly conducive to successful, uninterrupted operation are explained. Diagrams depicting a model installation, and a recommended system of remote control amplify this phase of the dissertation.

Various locations in the paper mill where dyestuff solutions may be added to the pulp are designated. While the suggested methods must necessarily be flexible to comply with individual mill requirements, the general use of continuous coloring is indicated.

This paper deals specifically with the uninterrupted dyeing of the fibers used in the manufacture of paper and paperboard. It is inevitable that in time a large proportion of the paper and paperboard manufactured in the United States will be colored continuously. Modern paper mill practice which stresses high speed, large tonnage, and streamlined operation, from the pulpwood to the finished sheet, demands that the dyeing procedure conform.

Continuous coloring has certain advantages and limitations which to our knowledge have never been brought to the attention of the industry. We will endeavor therefore to evaluate the present status of this method, suggest possible improvements and finally, to offer a means whereby paper and paperboard which is produced uncolored today, due to apparent obstacles, may be dyed satisfactorily and economically.

There are three factors that are essential in the successful operation of a continuous coloring system. Dyestuffs, equipment, and points of application must be synchronized if you are to produce a marketable product by this process.

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

[1] Member TAPPI, Chemical Engineer, General Dyestuff Corp., 435 Hudson Street, New York, N. Y.

Discussion of Dyestuffs

In considering dyestuffs we shall deal with the *basic, acid, direct,* and *pigment* types which are for various reasons particularly adapted to the coloring of wood pulp.

Basic dyestuffs are, by comparison with the other groups, best suited for continuous application. The fact that most of them are charged positively makes their attraction to the negative pulp more or less a foregone conclusion. Good solubility in water, high tinctorial power and brightness of shade are all factors which make this group of dyestuffs easily adjustable to the continuous coloring procedure.

Table I shows the percentage retention of the principal basic dyestuffs when mixed with several types of pulp for periods varying from 0.5 to 10 minutes. In order to simulate actual mill conditions in the investigation, size and alum were added first and then the dye was stirred with the stock for the length of time indicated. There is very little increase in retention after 4 minutes of contact time. Naturally, any change in rotation of adding color, size, and precipitating agent or the elimination of one or both of

TABLE I.—PERCENTAGE RETENTION OF BASIC DYESTUFFS

	Unbleached Sulphite				Unbleached Kraft				80% Groundwood 20% Unbl. Sulphite			
	Time of Contact in Minutes											
	½	2	4	10	½	2	4	10	½	2	4	10
Auramine	32	40	50	56	50	50	55	60	55	55	65	70
Chrysoidine	32	38	43	50	66	70	75	83	59	66	70	70
Bismarck Brown	91	92	92	93	82	91	93	93	91	93	93	93
Safranine	66	73	80	82	66	77	82	82	60	66	66	77
Rhodamine	43	43	43	43	55	55	55	55	32	43	43	43
Magenta	43	48	55	55	43	43	55	55	55	55	61	66
Methyl Violet	72	75	83	83	75	83	89	92	66	83	87	90
Paper Blue	82	89	89	91	83	93	95	95	89	91	93	93
Methylene Blue	66	66	77	77	77	77	83	83	60	66	72	72
Victoria Green	55	60	65	65	77	82	89	89	77	83	89	89

All tests made with 2% size, 3% alum, and 5 pounds dye per 1,000 pounds of stock in that rotation.

the sizing materials, will alter the retention figures appreciably. These tests show that a number of the basic types are adsorbed rapidly, preventing the loss of any large quantity in open systems and minimizing the build-up in closed systems.

Acid and direct dyestuffs should be added either before the size and precipitating agent or after the size and ahead of the precipitating agent. The latter procedure adapts itself most readily to continuous coloring, therefore we have used the rotation size, color, and alum in Table II. Dyestuff was added to the sized

TABLE II.—PERCENTAGE RETENTION OF DIRECT AND ACID DYESTUFFS

	Unbleached Sulphite			Bleached Sulphite			Bleached Rag		
	Time of Contact in Minutes								
	c3 a1½	c5 a2½	c10 a5	c3 a1½	c5 a2½	c10 a5	c3 a1½	c5 a2½	c10 a5
Direct Dyestuffs									
Paper Yellow	77	77	77	83	89	89	89	89	91
Benzo Fast Orange	89	93	95	91	91	95	95	98	99
Direct Red	87	91	91	91	93	93	96	98	98
Benzo Scarlet	94	94	95	89	93	93	95	96	96
Benzo Brown	85	85	85	83	87	87	85	93	93
Benzo Blue	89	89	93	89	89	93	93	98	98
Direct Black	95	98	98	95	98	98	95	98	98
Acid Dyestuffs									
Brilliant Pure Yellow	83	83	89	89	89	89	83	83	86
Acid Orange	43	55	55	43	55	55	43	55	55
Orange RO	77	77	77	77	77	83	84	89	89
Paper Red	71	77	77	82	82	82	77	82	82
Soluble Blue	81	81	83	85	85	85	83	85	85
Guinea Green	77	77	77	77	77	83	77	83	89

All tests made with 2% size, 5 pounds dye, and 3% alum per 1,000 pounds of stock in that rotation.
a = alum contact time. c = color contact time.

TABLE III.—SOLUBILITY OF DYESTUFFS IN WATER

	Ounces per gallon dissolved at 212 deg. F.	Ounces per gallon remaining dissolved at 60 deg. F. after 2 hr.
Dyestuffs (Basic)		
Auramine	2.15*	0.3*
Chrysoidine	3.7*	1.35*
Bismarck Brown	12.0*	6.0*
Safranine	16.0	4.0
Rhodamine	13.0	3.25
Magenta	2.5	0.2
Methyl Violet	10.0	9.0
Victoria Blue	12.0	5.0
Methylene Blue	8.0	5.0
Victoria Green	16.0	11.0
Dyestuffs (Acid)		
Metanil Yellow	21.2	5.3
Acid Orange	21.2	6.6
Brilliant Croceine	21.2	3.3
Guinea Green	10.6	10.6
Fast Bond Blue	10.6	5.3
Formyl Violet	16.0	16.0
Nigrosine	9.0	7.0
Dyestuffs (Direct)		
Stilbene Yellow	13.2	3.0
Benzo Fast Orange	9.3	2.5
Benzo Scarlet	5.3	4.0
Benzo Blue	16.0	12.0
Benzo Green	8.0	3.3
Benzo Violet	4.0	0.7
Direct Black	16.0	5.0

* Dissolved at 160 deg. F.

stock and then the mixture was agitated for 3-, 5-, and 10-minute intervals. The alum was subsequently introduced and stirred for 1.5, 2.5 and 5 minutes, respectively. Following this procedure, we found that the direct dyestuffs were held to a greater extent than the acid type. The exhaustion of the direct group on the paper fibers is also both uniform and consistently high.

When dyestuffs belonging to any of these groups are used there is a tendency to settle out as the saturation point is approached. This attribute varies for every color and Table III shows the average amount of each dyestuff which may be dissolved in New York City water at 212 deg. F. Other figures are given to indicate the amount which will remain in solution when the temperature is reduced to approximately 60 deg. F.

These figures were compiled under ideal conditions consequently they will have to be adjusted somewhat to conform with local mill practice. Table III shows the limitations with respect to dyestuff solubility.

Acid dyestuffs with few exceptions have very little direct affinity for the fibers used in the paper industry and therefore are not generally suitable for the continuous coloring process. They may be added to a continuous beater or chest in the event that time and the mixing facilities permit. It is essential, however, that the alum or precipitating agent be supplied to the furnish after the color.

In order to develop thoroughly the shade and strength of most direct types it is necessary to agitate the colored stock moderately for at least 20 minutes. If this group of dyestuffs is used in the furnish it is advisable to add the solution to the continuous beater or ahead of the jordan. Direct dyes as a class have rather low value and solubility factors; their use in deep shades is contingent upon suitable tank capacity and available space.

Pigments for convenience may be separated into two distinct groups, the dispersed and undispersed sorts. Since the latter must necessarily be ground into the fiber to insure proper distribution, any variation in the action of the beaters or the jordans will increase or reduce retention proportionately. The dispersed types on the contrary are much less sensitive to beating or jordaning action. If such a pig-

ment is applied to the stock in the continuous beater or ahead of the jordan cycle a reasonable amount of effective contact with the fiber will be attained. While the loss of insecurely bound particles may increase the cost of coloring, the advantages in many cases far outweigh the drawbacks. To bind any type of pigment firmly to the fiber it is imperative that you use size and a precipitating agent. The color may be added before or after the size but should be allowed to disperse thoroughly in the furnish before the alum is applied.

It may be well to mention two general rules for dyestuff solution preparation at this point. Do not under any consideration dissolve basic and acid or basic and direct dyestuffs in the same container. If this is done there will be a precipitation in the form of an insoluble lake which in some instances results in complete loss of color value.

Coloring Equipment

In Fig. 1 is shown an assembly of the apparatus suggested for continuous coloring. While all the items which have been included are not absolutely essential, the advantage offered by the adaptation of certain refinements cannot be questioned.

When selecting equipment for this purpose the following are the primary prerequisites. Dyestuffs in water solution set up galvanic action with certain types of metal. This in turn causes crystallization and precipitation with the consequent discoloration or reduction of the solution. It is necessary therefore to select materials which will be unaffected to secure ideal working conditions. The time factor is also important and metering devices which will discharge a free-flowing solution with a maximum amount of accuracy are demanded. Tanks may be of varying sizes dependent to a large extent upon the pounds of finished paper which the machine produces per hour. They are used for storage and mixing purposes.

The materials employed in constructing these receptacles may be classified as inert or active with respect to dyestuffs. Those most commonly used are listed under two headings, inert and active.

Inert	Active
Stainless steel	Bronze
Monel metal	Copper
Enamel lined	Steel
Glass lined	Iron
Rubber lined	
Wood	

In Table IV the results of a number of tests showing the effect of different metals upon dyestuff solutions have been compiled. Variations in shade and strength which occur when basic dyestuff solutions remain in contact with metal tanks are indicated. Bronze seems to be the least objectionable of the active types.

Those materials which are shown as active should not be used if conditions or circumstances warrant the purchase of any of the inert products. Rubber and wood are the exceptions due to limitations which will be discussed later.

Stainless steel has no effect whatsoever upon dyestuffs in water solution while the reaction with Monel metal is so slight that for all practical purposes it may be considered negligible. Enamel- and glass-lined tanks have a high breakage factor with the resultant increase in cost. If the lining of any tank chips or cracks, the base metal then may react with the coloring media. Rubber and wood tend to hold the dyestuffs in the walls of the tanks and are difficult to clean thoroughly. Unless a separate tank is used for each color, contamination may result.

Next in order is the selection of piping which most readily adapts itself to this process. The same reasons may be offered here for the adoption or rejection of various kinds of metal as were discussed above. There is one thing that must be remembered in constructing a continuous system and that is, to have as few right-angle pipe bends as possible. You are interested primarily in a free, steady flow of your color solution, therefore, any sharp curves will set up a permanent hazard. This is due to the tendency of dyestuff crystals or foreign matter to collect wherever the rate of flow is retarded, necessitating a shutdown to clean out the pipes. As a further precaution it is well to screen both ends of the pipe line with fine mesh stainless steel wire. Rubber hose is particularly suitable for this part of the system because its use completely eliminates the sharp angles. It is also flexible permitting the operator to easily dislodge any accumulation without dismantling the piping. Another fact worthy of note is the ease with which the pipe line may be taken down and replaced in case of necessity.

Since the dyestuff does not remain in contact with the pump for any length of time the type of metal used here is not of primary importance. The method of propulsion, however, is of vital concern. We know that dyestuff solutions which receive any severe form of agitation even under ideal conditions have a tendency to foam. This in turn locks the pump and causes the storage tanks to overflow. It is important that you select a pump which will put your dyestuff solution where you want it, when you want it, with the minimum of effort. Centrifugal pumps usually

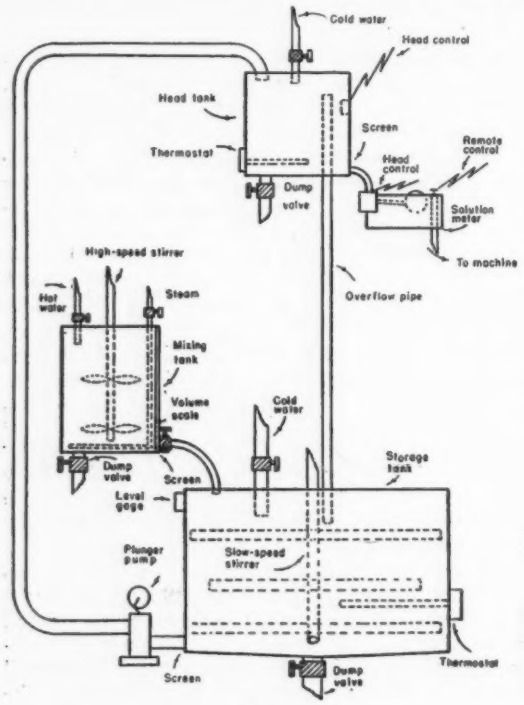


FIG. 1
Equipment for Continuous Coloring.

run at fairly high speeds churning the color solution as it passes through on the way to the head tank. We also believe that while an overflow from the suspended receptacle to the storage tank is desirable, recirculation of the color solution at high speed is exceedingly detrimental. Plunger pumps seem to offer a more effective means of transmission than the other designs. The type selected should have a reasonably slow positive action and at the same time be large enough to keep ahead of the actual machine requirements.

Agitation is advisable in both the mixing tank and the storage tank. A high-speed mixer for the former will permit you to dissolve the dyestuffs rapidly at high temperatures. The latter, on the other hand, should be equipped with a slow-moving agitator, the rotation being only high enough to keep the contents of the tank homogeneous.

The effect of changes in temperature on the solubility of dyestuffs is shown in Table III. Heating equipment thermostatically controlled is desirable to maintain a constant temperature throughout the system. If the solution is held between 110 and 120 deg. F. under normal conditions satisfactory results will be obtained.

The most important single item in the entire system probably is the *solution meter*. A solid well-designed instrument is required which will maintain a constant head while giving an even flow of color solution under micromatic control. Ordinary needle valves should be avoided whenever possible because they will clog readily. In selecting a lined or solid metering tank it will be well to follow the suggestions made previously, with stainless steel and enamel covered equipment receiving the preference. Meters of all sizes, shapes, and descriptions are in use at the present time. The only feature incorporated in all, by necessity, is the device to produce a constant head of solution. Square and rectangular slotted valves; dippers of various sizes, rheostat controlled; grooved pipes with adjustable drives; and contrivances for the partial diversion of flow; are just a few of the variations which have been successfully embodied in this equipment. In order to produce uniformly colored paper the operator should have micromatic control over the discharge of solution from the meter. In other words he must be able to vary the amount of liquid dispensed by the device with extreme accuracy.

As a safety measure contact instruments should be placed in several places to detect any stoppage of flow in the system. Alarm may then be transmitted to the man in charge by means of lights or sound anywhere in the plant. The cost of this equipment will be far less than the loss caused by human error. A permanent volume scale can be attached to the inside of the mixing tank where it will enable the operator to measure his additions precisely. A level gage for the storage tank placed near the mixing tank will permit rapid checking of the amount of solution on hand.

In considering the proper points for dyestuff application, it is first necessary to ask yourself this question: exactly what are the requirements of the finished product with relation to speed of production? The nearer to the machine we go in the use of dyestuffs the more exacting the requirements placed upon the precision of the apparatus. On the other hand the further away from the forming equipment you put your apparatus the greater the amount of colored stock between the meter and the reel. It would seem advantageous to set up a metering device as close to the wire as practicable in order that any change in the shade of the finished paper may be corrected without undue loss of time or production. Let us look at the machine in an abstract manner and choose the most likely places for color addition. You are limited of course to the selection of some point where the rate of flow and consistency of stock are uniform. Starting in the beater room we find the continuous beater where reasonably satisfactory conditions prevail. Here the color, size, and precipitating agent may be added in any desired rotation to insure a thorough mixing and brushing action. Due to the distance between the beater and the forming equipment either continuous or intermittent additions of color solution may be made.

Next in line would be any place just ahead of the jordans which conforms to the stated requirements. At this juncture we have the advantage of further brushing action to produce a homogeneous mixture. Due to the small volume of stock passing the selected position at any given time, however, close control of stock consistency and dyestuff flow is essential. Still

TABLE IV.—EFFECT OF METALS ON SHADE AND STRENGTH DYESTUFFS IN WATER *

Basic Dyes	Bronze	Steel	Copper	Galvanized Iron
Auramine	5% weaker	10% weaker	No change	10% weaker
Chrysoidine	No change	Redder and duller 30% weaker	No change	Redder and duller 30% weaker
Bismarck Brown	5% weaker	Redder and duller 30% weaker	10% weaker	Redder and duller 60% weaker
Safranine	No change	40% weaker	No change	15% weaker
Rhodamine	5% weaker	No change	No change	5% weaker
Magenta	5% weaker	10% weaker	5% weaker	15% weaker
Methyl Violet	No change	5% weaker	No change	15% weaker
Victoria Blue	No change	50% weaker	No change	50% weaker
Methylene Blue	No change	25% weaker	5% weaker	50% weaker
Victoria Green	5% weaker	5% weaker	5% weaker	40% weaker
Acid Dyes				
Metanil Yellow	5% weaker	10% weaker	10% weaker	10% weaker
Acid Orange	No change	No change	Duller and redder 10% stronger	Duller, 5% weaker
Brilliant Croceine	No change	No change	No change	10% weaker
Guinea Green	No change	10% weaker	No change	45% weaker
Fast Bond Blue	5% weaker	20% weaker	20% weaker	35% weaker
Formyl Violet	No change	10% weaker	No change	Bluer, 25% weaker
Nigrosine	No change	15% weaker	No change	25% weaker
Direct Dyes				
Stilbene Yellow	No change	5% weaker	10% weaker	Redder and duller
Benzo Fast Orange	No change	Slightly redder 20% weaker	15% weaker	35% weaker
Benzo Scarlet	No change	10% weaker	5% stronger	5% weaker
Benzo Blue	No change	40% weaker	10% weaker	25% weaker
Benzo Green	No change	20% weaker	Redder and duller	5% weaker
Benzo Violet	5% weaker	Duller, 10% weaker	Duller, 15% weaker	15% weaker
Direct Black	No change	35% weaker	No change	15% weaker

* Stainless steel and Monel metal show no change in shade and strength with these dyestuffs.

another possible location will be found where the pulp enters the machine chest. The utilization of this point is contingent upon the type of agitation which the chest receives. Any stirring device equipped with a variable speed motor which is capable of mixing the stock thoroughly in a short time will suffice.

On the paper machine itself the two most obvious places to add color are the mixing box and the fan pump. In both cases you are near enough to the wire to insure reasonable consistency control. Any dyestuffs added at these points depend entirely upon their affinity for the fiber to produce satisfactory exhaustion. Micromatic control is requisite here to obtain even results. When the consistency of the stock is constant and the flow in cubic feet per minute remains identical, it is a simple matter to make accurate additions of dyestuff solutions at the machine. As you well know, any increase in basis weight, when the batch system is used, will produce a deeper shade in the finished product. It is, furthermore, nearly impossible to judge machine production accurately enough to gage color increases to the beater in inverse ratio to the basis weight. A simple adjustment of the color meter will raise or lower the amount of color added thereby permitting the operator to vary from high to low basis weights or *vice versa* without loss of production.

Have you ever had occasion to wish that some miracle would happen and make the sheet which you have just torn off the reel a shade greener or redder, or for that matter whiter? Suppose for example, you have two or three beaters of colored stock in the chest which are slightly off shade. Additions may be made at that point when the agitation is satisfactory. This takes time though, and if you are not exceedingly careful the quantity of dyestuff which is added may be excessive. On the other hand a tank and meter above the headbox can be filled quickly with a weak solution of dyestuff and the shade will be adjusted promptly. All this results in a minimum loss of time and production. And now, let us consider the question of making the sheet visibly whiter. For years the textile industry has used fluorescent dyestuffs for special purposes, such as, the identification of materials, stage costumes, and rugs. Contrary to statements made in loosely written advertising copy, we have developed a dyestuff for the rug industry which gives a vivid true yellow under the ultraviolet lamp. Still another type which is yellow in solution may be applied to paper and will increase the apparent whiteness of the sheet. In some instances by applying such a dyestuff in the continuous system you are able to overcome intermittent variations of furnish components and maintain a uniform color in the finished product. Shading at the headbox is recommended only in an emergency to take care of possible production losses at the beginning of a run. Corrections should be made in the beater room immediately in order that succeeding batches will be uniformly colored.

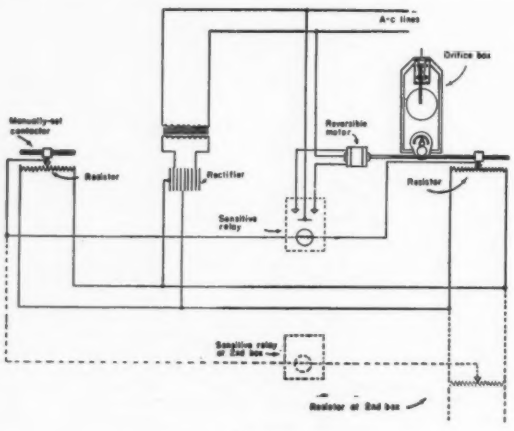


FIG. 2
Wiring Diagram for Remote Control.

Remote Control

If you observe the paper industry carefully or any other manufacturing group as well, you will find that those who succeed in the specialty field have one underlying conviction—i.e., no matter how difficult any problem appears at first glance, it can be solved.

We know that paper is graded for color at the reel after the sheet has had sufficient time to oxidize. It would seem reasonable therefore to regulate the additions of dye from that position. Naturally any device set up at the wet end of the machine and operated at the same point will produce far less off-color paper than equipment in the beater room. It does not take into consideration, however, the speed and tonnage which the modern paper machine is capable of producing. While the operator is walking from the wet end to the reel and back to the meter again, a high-speed machine can make a large quantity of unsalable paper. The remote control metering device shown in Fig. 2 is one answer to this dilemma. Picture if you will a color man who has previously filled his storage tanks with, say, three different dyestuff solutions. He then stands at the dry end of the machine and making a tentative setting on three rheostats, automatically adjusts the flow of solution from the meters at the headbox. Now, the paper is coming over the machine; in this case a brown which has been produced with a combination of red, blue, and yellow dyestuffs. The color man estimates, for example, that the shade is 10% weak and not red enough. He accordingly adjusts all three rheostats to conform. The effect of this change will almost immediately be indicated at the reel and if necessary a further correction may be made. With reasonable success the operator will be able to match the desired shade in less time than it would take him to walk the length of the machine.

Conclusion

Frankly the specific purpose of this article has been to inculcate in the minds of those who read it a desire to improve their present methods of paper dyeing. We are at the same time thoroughly cognizant of the fact that there are a few obstacles which must be overcome before continuous coloring will become simple and inexpensive enough for general adaptation. These difficulties can only be surmounted by those in the manufacturing end of this industry who have the initiative necessary to break away from obsolete practices. If, however, for any reason you are reluctant to make changes and doubt the actual necessity of dyeing your paper or paperboard, please remember this truism: Color *sells* Paper.

Acknowledgment

The author wishes to acknowledge the cooperation of the International Filter Company in preparing the remote control equipment diagram.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING MARCH 1, 1941

SUMMARY

Newsprint .....4,009 rolls
Miscellaneous paper.....98 cs.

NEWSPRINT

——, ——, Port aux Basques, 4,009 rolls.

MISCELLANEOUS PAPER

Japan Paper Co., ——, Kobe, 98 cs.

RAGS, BAGGINGS, ETC.

Williamson Products Co., ——, Santos, 22 bls. cotton picker waste, 152 bls. cotton waste.
Schimmel Trading Co., ——, Bombay, 400 bls. cotton waste.
Cohn Hall & Marx Co., ——, Bombay, 200 bls. cotton waste.
O'Brien Products Co., ——, Bombay, 800 bls. cotton waste.
C. Comiter Co., ——, Bombay, 200 bls. cotton waste.
Padawer & Co., ——, Bombay, 400 bls. cotton waste.
W. Intner Co., ——, Bombay, 195 bls. cotton waste.
Castle & Overton, Inc., ——, Bombay, 43 bls. rags.
Loumar Textile By Products, ——, Calcutta, 166 bls. hemp rope cuttings.
W. Steck & Co., ——, Calcutta, 224 bls. jute waste.
——, ——, Buenos Aires, 45 bls. rags.
Williamson Products Co., ——, Buenos Aires, 175 bls. cotton picker waste.
Irving Trust Co., ——, Rio de Janiero, 198 bls. rags.
New England Waste Co., ——, Rio de Janeiro, 103 bls. cotton residue.
E. C. Andres, ——, Shanghai, 200 bls. cotton waste.
C. Comiter Co., ——, Shanghai, 50 bls. cotton waste.

GLUE STOCK

Manufacturers Trust Co., ——, Buenos Aires, 119 bls.

CASEIN

American British Chemical Supplies, ——, Buenos Aires, 417 bags, 25,020 kilos.

BOSTON IMPORTS

WEEK ENDING MARCH 1, 1941

E. C. Andres, ——, Shanghai, 442 bls. cotton waste.

LOS ANGELES IMPORTS

WEEK ENDING MARCH 1, 1941

——, ——, Powell River, 1,625 pkgs. newsprint, 123 bls. paper stock. 445 bls. chemical wood pulp.
——, ——, Sao Paulo, 172 bls. cotton picker waste.
——, ——, Kobe, 1 cs. rice paper.
——, ——, Shanghai, 50 bls. cotton waste, 60 tons old bagging.

New Filler a Pigment Extender

A newly developed filler or pigment extender that is designed to give better sheet brightness and opacity at lower cost, increased ink absorption or greater bulk, has just been announced by Johns-Manville, 220 East 40th street, New York. This material, Celite 340, is also recommended by the manufacturer as an economical means of controlling pitch trouble.

Celite 340 is described as an amorphous diatomaceous, silica, chemically treated and air separated to produce a white, very fine, grit-free product with a G. E. brightness of 95. Among the characteristics listed are: very minute particle size, high oil and water absorption, and great building capacity.

Goes with Parsons & Whittemore

Frank E. Brophy, for many years connected with the sales department of the International Paper Company, from which position he recently resigned, has identified himself with Parsons & Whittemore, Inc., 10 East 40th street, New York City. This company, with a history of almost one hundred years in the paper trade, will utilize Mr. Brophy's services and experience in the domestic market in which activities he will be closely associated with J. P. Parsons.

Lusco Cylinder-Boiler Weld

Lusco Cylinder-Boiler Weld, is now offered to the industrial market. Its primary purpose is to effect a permanent repair of cracks and leaks in boilers, gasoline engine blocks, and circulating systems generally. Increased temperatures only make the repair more insoluble. Very important, too, the product conditions boiler water, prevents and removes rust, corrosion, and scale. Sold in pint cans. The C. F. Lusk Company, 6523 Euclid Avenue, Cleveland, Ohio.

Issues Anniversary Booklet

In commemorating the 50th anniversary of the founding of the National Folding Box Company, New Haven, Conn., the company has issued a handsome booklet. In it is reviewed the interesting account of a half century of business progress and something of the personalities of the men who have been prominently identified with the successful expansion of the company, to its present leading position in the complete designing and production of high quality multi-color folding paper boxes.

Rayonier Pulp Prices Hold

Rayonier Inc., has announced that its present domestic prices for dissolving and paper pulps will remain effective during the second quarter of this year.

This refers to the base prices of $72.50 per ton for the book grade of bleached sulphite; $85 per ton for the dissolving rayon grade, and $100 per ton for the acetate grade.

New York Paper and Pulp Market Review

Market Firmer With Signs of Improving Demand In White Paper Lines—Kraft and Paper Board At High Levels — Pulp Market More Active At Unchanged Prices — Rag Market Little Changed.

Office of the PAPER TRADE JOURNAL,
Wednesday, March 5, 1941.

A firmer and more active wholesale paper market is indicated in reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week. Demand is also reported as improved, with kraft paper shipments at a very high level.

The advance in industry and trade is indicated in the index of general business activity, which rose to 121.5% for the week ended February 22, from 121.1% for the previous week, compared with 101.7% for the corresponding week last year.

Paper production for the week ended February 22 was estimated at 89.6%, compared with 86.8% for 1940, with 76.9% for 1939, with 61.0% for 1938, and with 86.0% for the corresponding week for 1937.

Paper board production for the week ended February 22 was 80.0%, compared with 69.0% for 1940, with 68.0% for 1939, with 61.0% for 1938, and with 86.0% for the corresponding week for 1937.

New orders for many qualities of paper are quite widely reported as increasing. The definite uptrend in demand is, of course, largely attributed to the expenditures in furtherance of the national defense program, with the trend of government purchases of paper upward. Practically all lines reflect this increased activity.

Kraft paper production is reported to be continuing at capacity, with orders at a very high level and shipments substantially higher than last year.

Paper board production is also at a high level and about 11% above the output at this date last year.

The paper market is firmer and the strong demand is exerting pressure which normally should result in a moderate upward revision of prices. But the present state of industry and trade is so greatly dependent upon government expenditures for rearmament, that it may be viewed desirable to restrict the normal operation of the law of supply and demand by the imposition of maximum prices. A stabilized price structure at a moderate level has been advocated by Government authorities as in the country's best interests.

Mechanical Pulp

The mechanical pulp market is firm under a good demand. No important change in the market situation, or in prices, has been reported during the current week.

Chemical Pulp

As expected in the trade, announcement of contract prices by many domestic and Canadian chemical pulp manufacturers for the second quarter of the current year, are unchanged. The minimum price reported at this date on domestic bleached sulphite is $72.50 per ton; on unbleached sulphite, $63.50 per ton, while the current quotation on domestic bleached sulphate pulp is $82.50 per ton.

Rags

Mill buying of paper-making rags is reported fair to moderate this week. Prices are unchanged at prevailing representative market quotations.

Old Rope and Bagging

Demand for old Manila rope continues steady with prices firm and unchanged.

Trading in old bagging is reported fair at this date, with so considerable a variation in prices that the price level is confused.

Old Waste Paper

The lower grades of old waste paper continue to be in a strong position, under a good demand. Prices have been revised upward on strictly folded news, currently quoted at from .57½ to .62½; and on corrugated, currently quoted at from .55 to .60. No other important changes in prices has been reported at this date.

Twine

Fair to moderate demand is reported in the twine market this week. No important change from prevailing market quotations on any standard grade of hard or soft fiber twine has been reported at this date.

Suspend Operations at Wallomsac

[FROM OUR REGULAR CORRESPONDENT]

WALLOMSAC, N. Y., March 3, 1941—Operations at the local branch of the Stevens & Thompson Company were suspended early last week when the employees received their final salaries. Announcement was made that a few men would be retained in order to maintain a minimum amount of steam in the boilers in order to meet requirements. The equipment used in the manufacture of paper food trays and dishes has been moved to the branch at Greenwich where operations will be continued. Benjamin V. Busch, who has been foreman of the paper tray department in this village, has been retained in order to hold a similar position at the Greenwich mill. He plans to move there in the near future. Early in January officials of the concern petitioned the federal court for permission to close the mill in this village which received favorable action. The plant has been on the market for several months and it is understood that a number of concerns have investigated the possibilities of locating here although no definite offers have been made for its purchase.

Edward M. Graham Resigns

Edward M. Graham, president of the Eastern Corporation, with general offices at Bangor, Me., has resigned. It is understood that Mr. Graham's successor will be announced by the corporation at a later date.

KALAMAZOO

TILE CHEST

Adapted for Use with Agi-flo Pump

The Shartle Agi-flo agitates and delivers the stock. The Kalamazoo Glazed Tile Chest gives you the advantages of low cost storage and the utmost in cleanliness.

More than 700 installations of Kalamazoo Glazed Tile Tanks now in use prove their unvarying dependability. For maximum efficiency plan to use a Kalamazoo Chest with your next Agi-flo, or any other type of agitator.

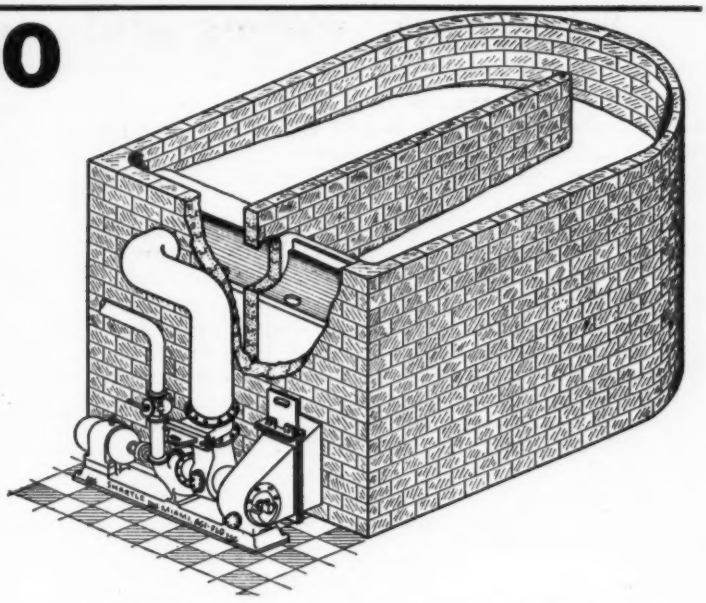


Illustration courtesy of Shartle Brothers Machine Company, manufacturers of the Shartle Agi-flo Pump.

GLAZED TILE

KALAMAZOO TANK & SILO CO.

KALAMAZOO, MICHIGAN

WOOD

More than just a

EXCELSIOR KNOX Woolen Co. Camden, Me. FELTS & JACKETS

TRADE MARK

BUT also a guarantee by men who for 75 years have prided themselves in making finer felts. TO YOU —this is the mark of dependability, longer felt life and greater saving.

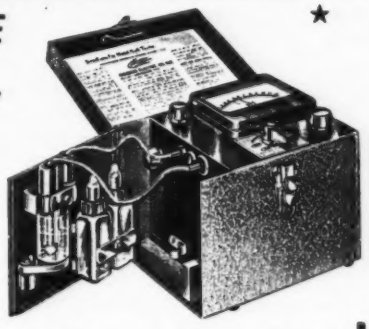
KNOX WOOLEN CO.
CAMDEN, MAINE.

"INVALUABLE

at the bleacher and beater"

is the way paper men describe the

COLEMAN INDUSTRIAL pH TESTER



Permits plant men to cooperate closely with the chemist as this simple Tester is used at the vat.

Water-tight construction . . . with a rugged glass electrode . . . plant men, above all, like its operating simplicity in quick pH control tests.

Accuracy is guaranteed through a single daily calibration . . . no extra buffers required with the Coleman.

Full range 0 to 12 pH scale. Metal case 6½ x 7 x 8¼ inches.

Complete, ready to use **$84.50**
5 DAY QUICK TRIAL

Bulletin PT 341 describes the Coleman Industrial pH Tester . . . write for it today!

LABORATORY SUPPLIES AND CHEMICALS
WILKENS-ANDERSON CO.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, March 5, 1941.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Demand reported fair for the week. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm with shipments reported steady for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are reported firm. Demand moderate for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 13 cents per pound; 80-100 mesh, at 13½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 12 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are unchanged. Shipments continue in steady volume. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—The demand for chlorine is reported good. Prices are firm and the market strong for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firmer with prices higher for the week, "G" gum rosin is currently quoted at $1.67 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.67 per 100 pounds, in barrels, New York. Seventy per cent gum rosin is quoted at $2.41 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm under a good demand with current quotations continuing nominal. Domestic salt cake is currently quoted at $17 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16.50 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand reported moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged for the current week. Pearl is currently quoted at $2.95 per 100 pounds; powdered starch at $3.05 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Shipments reported in good volume for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	42.50	@	—
Chip	40.00	"	—
Sgl. Mla. Ll. Chip	55.00	"	—
White Pat. Coated	70.00	"	—
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items.

Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10@$46.00		$40.25@$47.25
100% Rag	31.05 " 36.50		32.20 " 37.75
85% Rag	.... "		29.90 " 35.00
75% Rag	23.60 " 27.75		24.75 " 29.00
65% Rag	.... "		21.65 " 26.25
50% Rag	17.55 " 21.50		18.70 " 22.75
25% Rag	14.65 " 17.75		15.80 " 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items.

Delivered in Zone 1:

	Bonds		Ledgers
No. 1	$9.35@$11.50		$11.55@$12.75
No. 2	8.50 " 10.25		9.65 " 11.75
No. 3	8.05 " 9.25		9.20 " 11.25
No. 4	7.70 " 9.50		8.90 " 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	No prices		
Dry	No prices		
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
News Grade, delivered Unbleached Sulphite	58.00	"	63.75
(On Dock, Atlantic Ports)			
Kraft Bleached	4.12½	"	—
Kraft Light & Strong	3.50	"	3.90
Kraft No. 1	3.40	"	3.80
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	2.75	"	3.37½
(Delivered)			
Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.12½	@	6.37½
Silesias No. 1	4.50	"	4.65
New Unbleached	6.12½	"	6.37½
Blue Overall	4.15	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.50	"	3.65
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.50	"	1.65
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.15	"	1.20
No. 2	1.00	"	1.05
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

HIGHEST QUALITY CLAYS

LUMP and POWDERED } IMPORTED

PAPER MAKERS IMPORTING CO. INC. EASTON, PENNSYLVANIA, U.S.A.

DOMESTIC { CRUDE CRUSHED AIR FLOATED WATER WASHED

West Virginia Pulp and Paper Company

230 Park Ave. New York
35 East Wacker Drive Chicago
Public Ledger Building Philadelphia, Pa.
503 Market St. San Francisco, Cal.

Manufacturers of
ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

HIGH GRADE COATED BOOK

• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT LINER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:
Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

Policies, Too . . .

Ample resources plus a world of experience may only make a man the greater scoundrel. Both the man and your supplier of Fourdrinier and cylinder wires must be guided, too, by fair policies if you are to trust his product and his service.

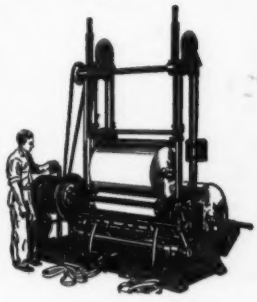
THE LINDSAY WIRE WEAVING CO.
Serving the Paper Industry Since 1903
14001-14299 Aspinwall Ave. Cleveland

Lindsay WIRES FOR PAPER MILLS

LANGSTON SHEAR CUT SLITTERS AND ROLL WINDERS

TYPE AA: built 40", 50", 60", and 72" wide; diameters 28" to 40". Speed up to 1500 feet per minute. *Shear Cut* and *Surface* or *Drum* Winding.

SAMUEL M. LANGSTON CO., Camden, N. J.



PAPER MILL MACHINERY

For Greater Profits

MIDWEST-PULPERS

Write For Details Today!

THE MIDWEST-FULTON MACHINE CO.
Dayton, Ohio

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	2.50	@	2.75
Wool Tares, light....	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	5.25	"	5.50
Domestic	5.25	"	5.50
Jute Threads.....	2.75	"	3.00
Sisal Strings	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	"	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book...	.80	"	.85
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	1.60	"	1.70
Ledger Stock Colored	1.20	"	1.30
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.40	"	1.50
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue..	.70	"	.75
Strictly Folded....	.57½	"	.62½
Corrugated	.55	"	.60
No. 1 Mixed Paper..	.35	"	.40

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18	@	—
White Hemp.....	.18	"	—
Fine Polished—			
Fine India	.22	"	—
Unpolished—			
Box	.16	"	—
Paper Makers.....	.13	"	—
Tube Rope.....	.14¾	"	—
Wall Paper.....	.16	"	—
Wrapping	.16	"	—
Soft Fiber Rope...	.14	"	—
Cotton	.24	"	—
(Hard Fiber)			
Medium Java.....	.10	"	—
Mex. Sisal	.09½	"	—
Manila	.23	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07	@	.07¼
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1.....	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached..	.06	"	.06¼
Washable Prints...	.02¼	"	.02½
Washable No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01½
Fancy Percales....	—	"	.03
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03¾
No. 2 Mixed.....	.01¾	"	.02
Corduroy	.01¾	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1...	1.30	"	1.35
Domestic No. 2...	1.10	"	1.15
Roofing Bagging..	1.00	"	1.05

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	2.25	@	2.50
Manila Rope.....	—	"	5.50
Sisal Rope.....	2.00	"	2.25
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.55	"	2.75
No. 2.....	—	"	1.50
Wool Tares, heavy..	3.75	"	4.00
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	2.25	"	2.50

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.40	@	2.50
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White.	1.90	"	2.00
No. 2 Soft White.	1.60	"	1.75
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.50	"	1.60
Ledger Stock, colored	1.20	"	1.25
No. 1 Books, heavy..	.80	"	.85
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.50	"	.55
Container Manila....	.40	"	.45
Kraft Paper	1.40	"	1.45
No. 1 Mixed Paper..	.35	"	.40
Straw Board Chip...	.35	"	.40
Binders Board Chip..	.35	"	.40
Corrugated Board...	.55	"	.60
Overissue News.....	.70	"	.75
Old Newspapers.....	.60	"	.65

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.90	"	3.00
No. 1 Soft White	2.75	"	2.50
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers.....	1.50	"	1.75
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock	.75	"	.85
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	"	1.50
No. 1 Kraft.....	1.25	"	1.30
Extra No. 1 Kraft..	1.45	"	1.50
Mixed Papers.....	.30	"	—
Print Manila	.55	"	.60
Container Manila....	.60	"	.70
Old Newspapers.....	.50	@	.55
Paper Wool Strings.	.95	"	1.10
Overissue News.....	1.00	"	1.10
Box Board Chips....	.40	"	.45
Corrugated boxes....	.50	"	.55
Kraft corrugated boxes	.85	"	.95
New Kraft Corrugated Cuttings.....	1.40	"	1.50
Screening Wrappers.	.70	"	.80

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	3.00	"	—
Domestic	2.80	"	3.00
Sisal Rope.....	2.90	"	3.00
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	2.50	"	2.75
Domestic	2.75	"	2.90
Soft Jute Rope.....	3.50	"	3.75
Manila Rope—			
Foreign	5.25	"	5.35
Domestic	5.50	"	5.75
Jute Carpet Threads	2.00	@	2.25
Bleachery Burlap....	4.00	"	3.25
Scrap Burlap—			
Foreign	2.60	"	2.65
Domestic	2.60	"	2.75
Scrap Sisal.....	2.75	"	3.00
Scrap Sisal for Shredding	2.90	"	3.25
Wool Tares—			
Foreign	2.70	"	2.80
Domestic	2.50	"	2.60
Aust. Wool Pouches.	2.75	"	3.00
New Burlap Cuttings	3.75	"	4.00
Heavy baling bagging	2.75	"	3.00
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	.06¾	"	.07
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	.0625	"	.0650
Underwear Cutters, Bleached	.06	"	.0625
Silesias No. 1.....	.05	"	—
New Black Silesias..	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached....	.06	"	.06¼
Blue Cheviots.....	.04¼	"	.04½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04¼	"	.04¾
New Black, Soft..	.03	@	.03¼
Khaki Cuttings.....	.02¼	"	.03
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.06¾	"	.07½
New Canvas.....	.06¾	"	.07½
B. V. D. Cuttings...	.06½	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.75	@	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.00	"	2.25
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues....	1.50	"	1.75
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.25
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias.....	(nominal)		

CHICAGO

Waste Paper

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings ...	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.10
Blanks	1.50	"	1.60
Krafts	1.40	@	1.50
New Kraft Cuts....	1.60	"	1.75
Overissue News.....	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Roofing Stocks—			
No. 1.....	.95	"	1.00
No. 2.....	.85	"	.90

New Johnson Joint

The Johnson Corporation, Three Rivers, Mich., announces that the larger sizes of the patented Johnson Rotary Pressure Joint are now available with renewable wearing plates. The new design, known as Type R, will find application, like the original Johnson Joints, in paper mills—wherever steam or liquids under pressure must be admitted into rotating rolls.

Sealing is accomplished by a carbon-graphite ring which takes the place of all packing and which is self-lubricating as well. The Johnson Joint also compensates in its design for misalignment—both lateral and angular—which, according to the manufacturer, is the root of so much trouble in connection with pressure joints.

This new Type R design is offered in all the various styles of the Johnson Joint, in the 3", 4", 5" and 6" sizes. All joints are rated for 150 lbs. maximum pressure. A comprehensive new bulletin will be sent by the Johnson Corporation on request.

Asks for Abitibi Report

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., March 3, 1941—Premier Hepburn promised the other day in the Legislative Assembly to make immediate enquiry concerning the date of submission of the report of the royal commission which several weeks ago concluded its long enquiry into the affairs of the Abitibi Pulp and Paper Company. The promise was in response to an enquiry by Col. Geo. A. Drew, leader of the opposition, who explained that the report of the special committee on lands and forests is being delayed until the royal commission findings on Abitibi are released.